The Builder.

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The Blackwall Tunnel.

THE subaqueous portion of this important work has just been completed, and on Wednesday a number of engineers and others interested in the work were invited by Messrs. Pearson & Son, the contractors, to visit the works. It will be remembered that the work of constructing this tunnel was commenced early in 1891, but it was not, however, until September of last year that the really difficult part of the work, namely, that of making the portion immediately under the Thames, was begun; and now, after but twelve months' labour, it has been finished. Never before has a work of such magnitude and difficulty been accomplished so rapidly and with such freedom from accidents, for, during the whole period of construction, not one life has been lost.

It is now seventy years since Brunel commenced his tunnel under the river at Wapping, and since that time, as might be expected, many improvements have been made in the methods and appliances for constructing such undertakings. It is curious to note, however, that the means he then adopted to successfully accomplish the work by which he will ever be remembered, have at least suggested the methods that are employed at the present day, and it has been suggested that it would be a graceful act on the part of the London County Council, and one detracting in no degree from the credit due to their Engineer, if medallion portraits of Brunel and Lord Cochrane—who was the first to suggest the employment of the pneumatic process for sinking cylinders—were placed at each entrance of the new tunnel. It is true the original Thames Tunnel is composed of brickwork, but there is evidence to show that Brunel would have preferred to have used a cast-iron lining instead, similar to that employed at Blackwall, if the cost of this—which at that date was about four times what it would be now—had permitted him doing so. In carrying out his great work, however, Brunel designed a "shield" capable of being pushed forward by hydraulic presses, or other means, and it is by the use of such an apparatus, modified and improved by Mr. J. H. Greathead, that engineers have been enabled to construct those subaqueous tunnels that have been made during recent years, both in this country and in America.

The necessity of additional communication across the Thames below London Bridge has long been recognised, and the subject was under the consideration of the authorities of the City and the Metropolitan Board of Works many years ago. The Thames Tunnel at Wapping, and the small subway, suitable for foot passengers only, near the Tower of London, afforded for many years the only means of crossing this part of the river. An attempt was made in 1877 by the Thames Steam Ferry Company to deal with the traffic at a point about a mile and a-half east of London Bridge; but notwithstanding a considerable outlay, their efforts were at no time very successful, and their operations ceased altogether a few years later. This was followed by the Free Ferry at Woolwich, and later by the construction of the Tower Bridge; but there is a long stretch of river between these, and it was evident that additional accommodation was urgently needed. As long ago as 1886 the Metropolitan Board of Works instructed their Engineer, Sir J. Bazalgette, to prepare plans for a tunnel at Blackwall, and the sanction of Parliament was soon afterwards obtained to carry out the proposed work. Powers were then obtained to construct three tunnels, all close together, two of which were intended for vehicular traffic, and the third for foot passengers; and the Board considered it to be desirable to make the one for pedestrians first, it being smaller in diameter than either of the others. Tenders were accordingly asked for, and that by Messrs. S. Pearson & Son, who undertook to construct a tunnel 15 ft. in diameter for 318,840*l.*, was accepted. There is no doubt that this work would have been carried out, but just at that time the Metropolitan Board of Works were succeeded by the London County Council, and this latter body did not consider it expedient to proceed with the scheme as then proposed. The whole question was, therefore, thoroughly reconsidered, various engineers of eminence were consulted, and finally Mr. A. R. Binnie, the Engineer-in-chief to the Council, reported that, in his opinion and that of his colleagues, it would be best to have but one tunnel, making it 27 ft. in external diameter, with a roadway 16 ft. wide, and two 3 ft. 1½ in. footways.

New designs were then made, and tenders asked for, the result being that Messrs. S. Pearson & Son were again successful, the amount of their tender being 871,000*l.* It must be remembered, of course, that this price is merely for the constructional work, and does not represent the total cost of the tunnel. The claims for land, and the various trade interests that it was necessary to acquire, amounted to an additional 432,000*l.*, although these have been settled, we believe, for about two-thirds this sum.

The construction of the tunnel is as follows:—Near each bank of the river a vertical shaft 58 ft. in external diameter has been sunk, and between the bottom of these the subaqueous portion of the tunnel, 1,221 ft. in length, has been made by driving from one end only. The approach to the tunnel on the Middlesex side is 2,470 ft. in length, and that on the Kent side 2,480 ft. in length, the gradients being 1 in 34·4 and 1 in 36·2 respectively. Between the entrance of each approach and the shafts above referred to, there is another shaft of the same diameter as those at each end of the subaqueous portion. These shafts are numbered for reference 1, 2, 3, and 4, counting from the Middlesex side, and besides aiding the ventilation they will all, except No. 3, contain stairways, and thus provide a means of access to, or egress from, the tunnel.

The portion immediately under the river, as well as the greater part of the approaches, is circular in diameter, and is lined throughout with cast-iron plates from 1½ in. to 2 in. in thickness; each plate is 2 ft. 6 in. wide, and fourteen are required to form a complete ring, they being bolted together by 1½ in. bolts. This cast-iron lining was made and supplied by the British Hydraulic Foundry Company; it is required for a length of a little over 3,000 ft., and the total weight is 20,000 tons. Work was commenced by sinking No. 4 Shaft or caisson, this one being chosen because it was foreseen it would be easier to drive the tunnel from this side of the river on account of the ground being more favourable, and it was thought that the experience gained in doing the simpler portion would be of great value when the work became more difficult.

All the four caissons are similar; they are composed of two skins, the batter of the outer one being 1 in 100 to facilitate sinking; and provision has been made for adding an air-tight floor, should it be found desirable to ultimately sink any of them by the pneumatic process. No difficulties were, however, experienced in sinking No. 4 Shaft, and it was not necessary to resort to compressed air. Loamy clay, peat, ballast, and London

clay were met with during the sinking, which operation occupied about nine months to accomplish. It may be interesting here to mention that the skin friction in the London clay and Thames ballast was about 3½ cwt. per square foot.

The shield that has been so successfully employed was made by Messrs. Easton & Anderson, of Erith. It is 19 ft. 6 in. long over all, 27 ft. 8 in. in external diameter, and weighs 250 tons. It is composed of an outer skin of four steel plates, each ⅝-in. thick, and an inner one extending for about half its length. The interior space is divided by two vertical air-tight diaphragms, the material, as it is excavated from the face of the tunnel, being passed through these by means of shoots, provided, of course, with air-tight doors. As the ground is excavated to form the tunnel, the "shield" is forced forward by means of twenty-eight hydraulic rams, each 8 in. in diameter, and as the ordinary working pressure to effect this is two tons per square inch, a total force of no less than 2,800 tons can be exerted, and even this has, at various times, been considerably exceeded. The rams can also be used to guide the "shield" in the direction of its line of travel.

Had the No. 4 Shaft been sunk to its full depth when the shield was delivered at the site, there is no doubt that the latter would then have been erected in position at the bottom of it, but this shaft was not then within a considerable distance of its ultimate depth, and consequently, in order to save time, a small dock was made close to, and connecting with, the top of the shaft, and in this the "shield" was entirely put together. By the time this had been done the sinking of the shaft had been completed, and the problem now was to get the "shield" from its dock into a position ready to commence the tunnel. An ingenious method was adopted to effect this. The ends of the "shield" were boxed in by timber, so that it would float, and water was afterwards admitted into the dock and the shaft, entirely filling both, since, as we have already said, these were in direct communication. The "shield" was then floated out of its original position to the centre of the vertical shaft, and then by gradually lowering the level of the water by pumping, it was caused to rest on the ground at the bottom of the shaft directly opposite the centre line of the tunnel.

In June, 1893, sufficient progress had been made to admit of the first of the cast-iron rings being put in position, and for some time after this, good progress was made, but when a length of 120 ft. had been constructed, the lower cutting edge of the "shield" got considerably damaged by coming into contact with some hard material, and although this was not at first considered very serious, it was afterwards found that the damaged portion could no longer be subjected to very great pressure. The "shield" had then advanced nearly 200 ft. from the shaft, and it was of course impossible to withdraw it, as the cast-iron lining of the tunnel for this length had been completed. It was also equally impossible to repair it in the position it then occupied, so that all idea of effectually dealing with the damaged portion had to be given up until it had travelled a further distance of 400 ft., and No. 3 Shaft had been reached. To admit of this being done a timber heading was driven in advance of the damaged portion of the "shield," and along the bottom of this a concrete bed was laid, and this arrangement made it possible to push the "shield" forward without further harm being experienced.

The driving of the tunnel was, however, suspended when it was within some 70 ft. of No. 3 Shaft, as it was thought desirable that this shaft should be entirely sunk before the "shield" was pushed further forward. This, of course, was the cause of some time being lost, and it was not until May, 1894, that the portion of the tunnel between Nos. 3 and 4 Shafts was completed.

As soon as the shield could be got into No. 3 Shaft, the work of repairing its cutting edge was commenced. It was then found that the damage that had been done was greater than had been anticipated, and it took four months to get everything in working order again. Consequently, it was not until the month of September of last year that the subaqueous portion of the tunnel could be begun.

The construction of this portion was done rapidly at first, but when about two-thirds of the whole distance had been completed, the "shield" entered ballast that was in direct communication with the river, and the difficulties were then, of course, greatly increased. At this time there was only a distance of some 5 ft. from the river-bed to the top of the "shield," and an immense quantity of clay had to be deposited from barges along the line of the tunnel, a resource which was attended with most satisfactory results. Notwithstanding this and other causes of delay, the "shield" arrived at No. 2 Shaft a little more than a month ago, thus bringing to a successful termination a work of more than usual magnitude and difficulty.

It should be mentioned that compressed air was not employed for forming the tunnel until the "shield" was midway between Nos. 3 and 4 Shafts, and that the maximum pressure that has been found necessary has not exceeded 35 lbs. per square inch above the normal pressure of the atmosphere.

SOME DANISH CHURCHES.

DENMARK may be lacking in interest to the ordinary tourist, owing to the high state of agricultural cultivation which obtains throughout the country. Architectural joys do not meet us at every turn, as in Belgium or Holland, for instance, but the Renaissance, as we know it in Northern Europe, has made its influence felt here as elsewhere. It was in August last, during glorious holiday weather, both at sea and on shore, that the writer and a friend visited the country. Though absent from home but three weeks, the bracing climate, the perfect freedom of the country, and its cheerful and friendly inhabitants, have left a very favourable impression.

The route taken was direct from London to Copenhagen, "for the sake of the voyage," starting from Millwall Docks — to reach which, late on Saturday night, was the only part of the journey attended with any difficulty—on the s.s. *Olga*, belonging to the Danish "United Steamship Company,"* which owns the largest commercial fleet in the world so far as numbers are concerned, the officers and crews being all Danes. The company carries on a large trade, chiefly with Baltic and Mediterranean ports. The Danes are, of course, splendid sailors; many of them find employment as seamen in our own merchant service; it is probably to our kinship with them that we owe our pre-eminence as a naval nation.

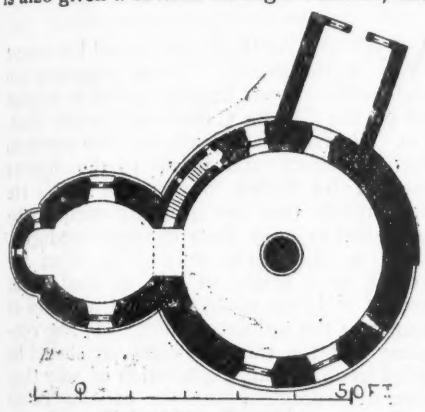
The coast-line of the west and north-west of Jutland is low, and dotted here and there with summer bathing-places, as is the case all along the Danish sea-border. Through the Skager Rak, round the Skagen Point, with its fine lighthouse, better known to English sailors as the Skaw, then making nearly due south through the Cattegat for the Sound, past the fine old Castle of Helsingör, only two and a quarter miles from the shores of Sweden, which are well wooded, with the town of Helsingborg spreading itself along the coast; the large number of fine sailing ships engaged in the Baltic timber trade, which all have to pass through these narrows, adding wonderfully to the interest at this point. Helsingör is the Elsinore of Shakespeare's Hamlet, and off here Campbell laid the scene of his fine poem, "The Battle of the Baltic." The castle, quadrangular in form, is imposing and picturesque, being built of stone (1574-85), some older work—the castle proper—being incorporated with it. It has high dormers on the sea-front, with three tiers of lights in them, and above all stands a copper-covered lofty bulbous spire of several stages; the angle towers are octagonal. Four hours more at sea, hugging the wooded shore of Zeeland, dotted with comfortable-looking summer residences, rounding the island battery, "Trekroner," and we were at Copenhagen —or Kjöbenhavn, as the Danes spell it—some sixty hours' voyage from London. Conspicuous objects from the harbour are the twisted spire on the Bourse, formed of four dragons in lead, whose heads sprawl over the angles of the turret from which it springs, the modern dome of the Marble Church, the lofty "corkscrew" spire of St. Saviour's Church with its external stairs, and the great Round Tower which has a winding roadway up it. The town is chiefly paved with granite blocks, is well supplied with parks and gardens; advertisements are conspicuous by their absence. The chief street, the Öster Gade, contains the finest shops, which are all solidly built from the ground, not stilted up on "lead-pencils" and plate-glass. The town is also rich in royal palaces, for the most part of dignified appearance. The Amalienborg in reality consists of four small palaces across the angles of a public square, two of which form the residence of the king when in the capital. Outside the door are two sentries, in uniforms not unlike those of our Guards in 1814, who hug their magazine-rifles in the manner made familiar to us by Mr. Punch. Most of the palaces are occupied as museums and art galleries, notably the Princes' Palace. (By the way, "slot" is the — to our ears — undignified Danish equivalent for a palace.) The local S. K. M. is very rich in Scandinavian art treasures of all kinds, dating from the earliest times to the seventeenth century, and, if inferior to our own collection, is, at any rate, infinitely better housed. Other exhibits in the Rosenborg Castle carry on the sequence to the beginning of this century. This castle is of red brick and grey sandstone, built early in the seventeenth century, in a style reminding one of Elizabethan. Of this period and style also are two churches, a few houses, and the Bourse, also the celebrated Frederiksborg Slot, about twenty miles from the capital, on three islands in a lake surrounded by beech forests; it is known as the style Christian IV.

Thorwaldsen has a museum to himself, and there is another museum of sculpture collected and presented to the nation by the brewers of Carlsberg öl; we did not visit it, but we drank the "öl," and very good it was, particularly the "gammele Carlsberg," so should the firm repeat their gift to their fellow citizens, we shall have the satisfaction of reflecting that we have contributed towards it. The town is very flat, and forms a happy riding-ground for innumerable bicyclists, the "machine" being largely patronised in Denmark; the sanitary arrangements, even in the best hotels, are primitive, drains, as we understand them, not being in vogue.

From our head-quarters at the Hotel Kongen af Danmark we made several excursions, the most interesting being a voyage to Bornholm, an island situated in the Baltic, about twelve hours by steamer from Copenhagen; it belongs to Denmark, is about twenty-four miles long by twelve miles broad, an exposed spot enough, out of sight of the mainland and wind-swept by the north-eastern gales. Landing at Rönne, we found it to be a town of three or four wide and winding streets paved with cobble-stones, flanked by low whitewashed houses of scrupulous neatness, many of them half-timbered, standing on a dwarf wall of large stones, the post not framed into a cill-piece, but resting on the wall; the shaped-ends of the tie-beams project through the posts, and are pinned with wooden keys; about a foot or so above these are the dripping eaves of the red pantile roofs; some have low dormers, and the brick chimneys are very low; case-

* Det Forenede Dampskip Selskab.

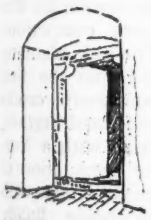
ments of wood with iron straps at angles and all are hung to open. Gable-ends project, and are boarded perpendicularly; there is some variety in the treatment of the doors and doorways. These remarks may apply generally to all the houses we saw in the island. A twelve-mile drive from Rönne to the rocky north-east coast, and we found ourselves at the pleasant summer resort, "Helligdomsgaarde," of many Danes and Germans, where we were the only English visitors. Along this coast are the only rocky cliffs in the whole of Denmark. Bornholm contains some remarkable churches, which succeeded in arousing the interest of my sporting companion. I measured two of them, plans, &c., of which I am able to place before the readers of the *Builder*. Four of these circular churches still exist. Olskirke and Österlars I measured; I also give a plan of Nylarskirke from Major Heale's "Ecclesiology of Gottland, other than that of Wisby; and the Churches of Bornholm," published in 1889, in which is also given a section through Olskirke, and



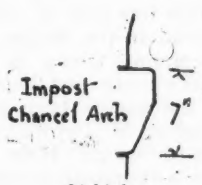
Nylarskirke, Bornholm.

a good photograph of Nylars, showing one of the characteristic belfries, a book I should have been glad to have known before my visit. Should I have another opportunity of going I shall take it with me, and hope not to leave the camera behind at Copenhagen! The other plan is from "Murray's Handbook for Denmark."

Olskirke is entered through a large porch, roofed with red tiles, and generally supposed

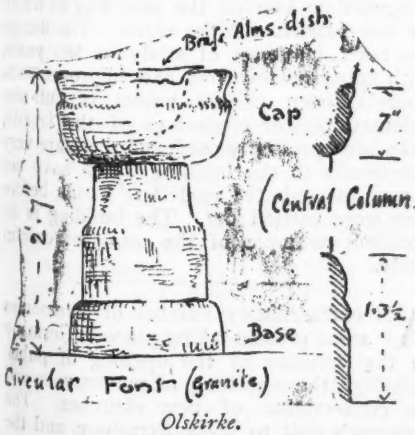


Olskirke: passage from church to porch, showing granite curb, &c.



Ol kirke

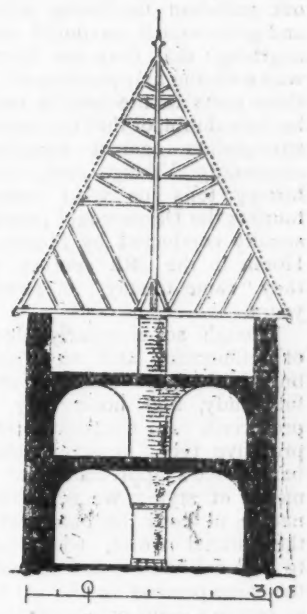
to have been for deposit of weapons before going in to worship. A large west gallery, containing a small organ and seats, cuts awkwardly into the vaulting. This gallery, the seats in the nave, and the reredos, which



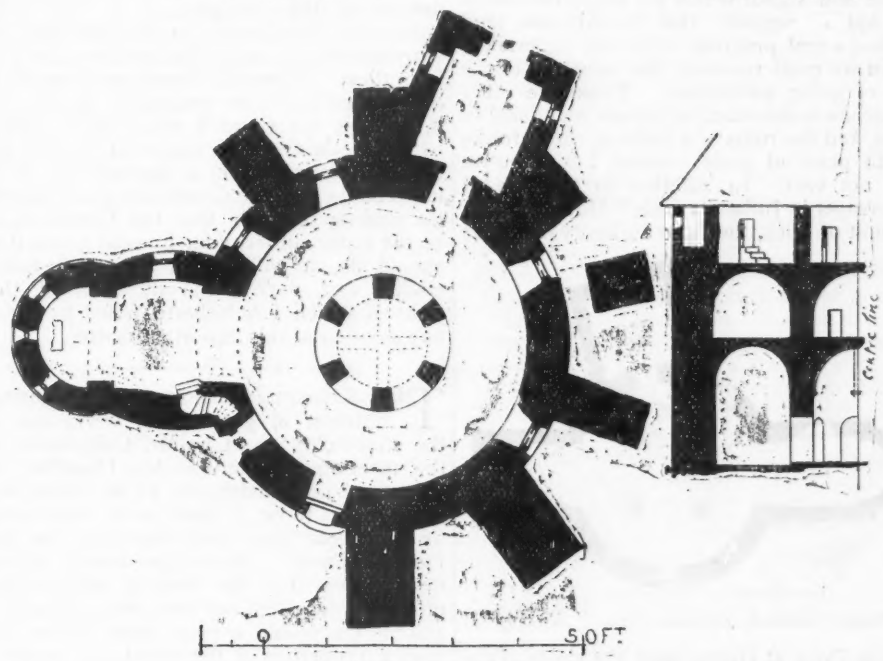
Olskirke.

contains an oil painting, are of varnished pine, and exceedingly mean. The whole effect is very unusual, if only from its extreme simplicity. The chancel arch, 7 ft. wide, is

Olskirke, Bornholm.

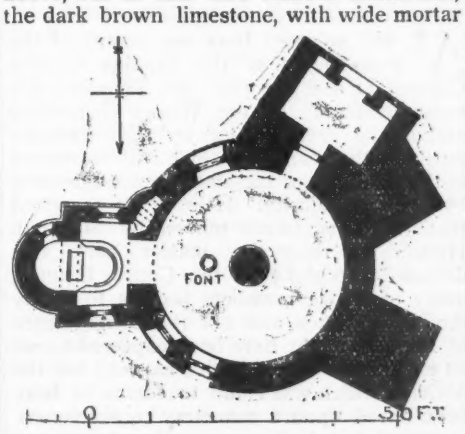


Section—Olskirke.



Österlars, Bornholm.

9 ft. 6 in. high in the centre; the entrance to the stairs is nearly 9 ft. above the floor-level, and is reached by a ladder. The central column and circular vault is repeated above, but in this case without whitewash, the dark brown limestone, with wide mortar

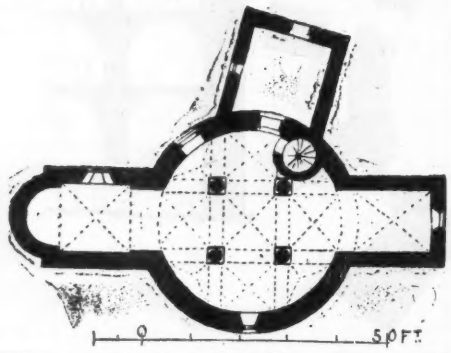


Olskirke, Bornholm.

joints, being exposed. The conical roof of rough timber and of moderate scantlings is open to the next floor, which we found encumbered with rubbish, twigs, and other ingredients of many generations of birds' nests. The roof rested on the outer wall, without any plate, and very possibly dates from 1794, which date is perforated on the weather-vane. Osterlars Church lies rather more inland, in a still more lonely situation, having but one farmhouse within "shouting distance" of it, the occupier of which was a find, as he spoke English well, having been a sailor, and also a miner on the New Zealand goldfields; he and his wife and family do most of the farmwork themselves, seemed to enjoy the process and to be quite satisfied with the result. His wife was weaving, at an old-fashioned hand-loom, wool grown on their own sheep, to be made up by themselves into clothes for their own use. This church is rather more ambitious in plan, and has curved walls to the chancel. The buttresses, which are enormous, are looked upon as additions; possibly the vaulting was thrusting out the walls. Iron ties show outside here, as well as in other cases, and here, as elsewhere, one is debarred from much possible archæological "fun" by the thick coats of dazzling whitewash. A restored fresco of a very early type decorates the outer surface of the inner wall above the arches of the inner dome, and in the apse are to be seen the remains of what was probably a pre-Lutheran stone altar; the apse is used as a vestry. In the great square belfry near the church are two bells of very fine tone, the largest being 3 ft. 2 in. in diameter; each had an inscription around it, and very beautiful borders in high relief, and on one occurred a crucifix, with the B. V. M. and St. John, and on the other "S. Niclas" as a bishop, most delicately modelled; they bore dates 1684 and 1640. One hesitates to

account for the peculiar planning of these churches, for fear of proving too much, without sufficient familiarity with the subject, and given which, no doubt one could prove anything: that they are identified in some way with the first planting of Christianity in these parts in the twelfth century there can be little doubt, or that they served as fortified strongholds against surprise visits from marauding Vikings and others. English history tells us what very disagreeable tourists the Danes could prove, whether personally conducted by Messrs. Hengist and Horsa in the fifth century, or later, when they "came to stay" for some five hundred years.

Though so singularly devoid of detail or refinement, and so "*early*," I cannot but think these churches worthy of careful study, and hope they may be long preserved. An occasional reversion to any primitive type, however rude, need be no bar to one's appreciation of later developments of style; we see examples of it in nature, in both the botanical as well as in the animal world, when long subjected to high cultivation, and it may well be that the same process in the art world may help to secure for our own work those qualities of force and vigour which we might otherwise be apt to neglect; this would also tend towards real progress—if wisely undertaken—for we must recollect that progress is the *art* of going backwards. There are other churches in the island which are rectilinear in plan, and the ruins of a castle at the extreme north point of great interest, but these we did not visit. In addition to the one at Thorsager in Jutland, which, "Murray" says, is built of brick, the same authority mentions



Thorsager Church, Jutland (from "Murray").

one in Fyen, at Horne, near the shore of the Little Belt, as "originally circular," also at Gjorslev, on the coast of Zeeland, an old mansion containing a hall with "a single central pillar," and not far off at Store Hedinge "a remarkable old church originally octagonal."* We visited the Cathedral of Roskilde, about twenty miles from Copenhagen, where most of the Danish kings are buried. It is built of brick, and vaulted 82 ft. high inside. Many of the royal tombs are sarcophagi, covered with black velvet, and silver and copper plaques. There is some very rich ironwork, dated 1625, enclosing some of the chapels. The altar-piece is a magnificent Renaissance triptych, in twenty-one compartments, elaborately carved, painted, and gilded. It is supposed to be Dutch and sixteenth-century work.

Another long excursion was by steamer and rail to Frederikshavn, and on by a miniature railway to Skagen, the most northern point of Jutland; a wild district of sandhills and heather, a favourite spot for artists of the modern Danish school. The church is modern, but contains a fine old model ship, suspended in the nave, and a pair of Gothic brass candlesticks, dated 1590, exhibited with some pride by the minister, who informed us that the tower we had seen half-buried in the sand is all that remains of the old church dedicated to St. Lawrence, and founded in 1459 by two sailors, a Scotchman and a Dutchman.

H. Rose.

* "A round church (1150) at Bjernede. . . . Besides this there are only two in Denmark, though four others are found in the Island of Bornholm."

NOTES.

THE way in which the London County Council deals with the water question is enough to make the public doubt if it will ever show real business capacity. Having rejected an amendment to the Report of the Water Committee that the Bills of last Session should be proceeded with, it last week passed an amendment in the following terms:—"That the Council, having decided not to proceed with the suspended Water Bills, and desiring that the Council should be the Water Authority for London, it be referred to the Parliamentary Committee to report without delay the lines on which they suggest the Government should be asked to legislate." That is to say, having declined, as was quite right, to go on with these Bills and to leave the matter in the hands of the Government, the Council gives directions to a Committee to prepare a scheme, or its outlines, which the Government is to carry out, based on the principle that the County Council is to be the water authority for London. The Government, which rightly should have the responsibility of settling this great question, must be left with a free hand to lay down the principles and the details of the change. It is obviously childish for the Council to suppose that the Government can accept the outlines of a Bill from them. When the Government measure is prepared it will be reasonable to criticise it, and for the Council to lay their views before the Minister in charge of the Bill by the ordinary means of a deputation. It is improbable that the Government will accept the primary principle that the Council is to be the water authority for London; even if it should do, it will be on its own responsibility, and not at the dictation of the Council, which has hitherto failed to effect any solution of this important matter.

THE Nicaragua Canal seems to be causing interest in great canal work, and if the statements given by Mr. Colquhoun, at the meeting at the London Chamber of Commerce on Monday, are to be relied on, there seems to be, at least, more chance for its execution than there ever was for the Panama Canal. As to the doubts which were expressed at the meeting whether the probable traffic had not been over-estimated, and too favourable a view taken as to the paying properties of the canal, our impression is that a canal in such a position would, to a great extent, make new traffic, and that the shortened route between the Atlantic and Pacific, and the avoidance of the necessity of going through the Straits or round the Horn, would actually give a new stimulus to shipping trade.

AS will be seen from our report of the proceedings of the London County Council at the meeting on Tuesday, the recommendation of the Works Committee authorising them to let for advertisement purposes the hoardings which will be erected at the Whitefriars fire-station, was agreed to by a large majority. It is to be regretted that the amendment moved by Sir John Hutton to refer the matter back was defeated, especially as the County Council, many of whose members profess to desire the beautification and not the disfigurement of London, might have been expected to set an example to others in this matter; but the decision which was come to seems to have been based upon a monetary consideration, or regard for the "ratepayers' pockets" and the allurement of a "large sum for letting the right of advertising on the hoarding." With the majority of the Councillors, the question of æsthetics received little consideration, though one of the labour members, who claimed to desire the beautification of London, was bold enough to remark that the ultimate result of letting the Council's hoardings for the purpose in question would be to make London a veritable "picture-gallery," and it was further urged by another speaker that many public advertisements were very beautiful — the inference presumably being that therefore the ugly ones might, on that account, be endured. It is surprising that the Council seems prepared to accept a lower standard than that set by the City in this matter, or by Glasgow, where the Corporation has decided that the municipal trams shall not be disfigured by advertisements. But more practical considerations might have influenced the Council, for it cannot be doubted that advertisements on hoardings tend to depreciate surrounding property, and that hoardings are kept up much longer than they need be until the advertisement contract has expired. The recommendation of the Committee related only to the Whitefriars fire-station hoarding, but there can be no question that, unless the members of the County Council materially alter their views, the practice will be indefinitely extended, and the streets of London made to look more hideous than they are at present.

MAJOR CARDEW has issued his report to the Board of Trade regarding the fatal accident to an English cyclist in August last on the Giant's Causeway Electric Railway. He finds that death was due partly to electrical shock and partly to the injuries received by falling across the rail. He recommends that the tramway company be compelled to raise their charged conductor, which is at present only 18 in. from the ground, to a height of 8 ft. at least, as at present it is an annoyance and a source of danger to the ordinary traffic. He also considers that the tramway company should be called upon for an explanation of why they have not complied with the existing Board of Trade regulations, and that until they do so, and have made the required alterations, they should discontinue the use of electrical power and use only steam.

THE Imperial Law Courts at Leipzig, which were opened by the Emperor on Saturday, have been erected from designs by Herr Ludwig Hoffmann, on whom the title of "Baurath" has now been conferred in connexion with the ceremony. Herr Hoffmann obtained the commission for this important building in an open competition which was held in 1884. The able planning shown in the design gained him the first premium. Owing to the successful candidate's youth and inexperience, and further, to his having been associated with a Norwegian, M. Dybwad, in the preparation of his drawings, Herr Hoffmann met with much opposition prior to being finally entrusted with the work. He was at the time only thirty, and had not held any responsible position. He had only been known as a successful competitor for the Shinkel Prize and other academic premiums. The successful completion of the building has shown the authorities that they did well to accept him as architect, and we must congratulate him on the able way in which he has carried out the work. The design has been a subject of study for ten years, with constant revisions and improvements. Models, even to the extent of full-size coloured plaster renderings of the façade, have been profusely used, and there are very few details in the building which have not passed through the modellers' hands before they were carried out. The building is an excellent example of the result of careful study.

AN extraordinary number of ceremonies are at present taking place in Germany on the occasion of the opening of public buildings, the unveiling of monuments, and the consecration of new churches. The Emperor's visit to Metz, Strasburg, and the battlefields of the Franco-German War, has been the occasion for unveiling several memorials. Of these the most important one is the Emperor Frederick Monument at

Woerth. At Berlin the unveiling of a monument to the Empress Augusta on the "Opernplatz" took place on the same day as the consecration of the new memorial church to the Emperor Frederick. At Leipzig the New Imperial Supreme Law Courts were opened by the Emperor, and at Frankfort a new Central Post-office, which is practically a district centre for South Germany. At Darmstadt the new Royal Technical College was opened, and at Bremen there was a ceremony in connexion with the completion of some new Courts of Justice. Of the churches inaugurated in the provinces the principal ones were at Munich, Cologne, and Dortmund. Numerous other ceremonies have yet to take place.

MR. ARTHUR J. EVANS, writing to the *Times* from Dublin, raises a plea in which we heartily sympathise, for the formation of an Irish museum of national art and antiquities, in place of the mere lendings from South Kensington, which, according to his account, now form the bulk of the contents of the exhibits in the museum got up under the auspices of the Science and Art Department. It appears that the Royal Irish Academy have already got together a collection which would form the nucleus for a national museum, if it were properly arranged and exhibited, and which might be much farther extended. We hope Mr. Evans's suggestion will not fall to the ground.

THE nave of the Abbey, or more correctly the Priory Church, of Llanthony, has just been restored, under the superintendence of Mr. J. J. Spencer, of Abergavenny, by the liberality of Lord Llangattock, Mr. Walter Savage Landor, and others. It stands on the reputed site of St. David's Chapel, by the River Honddu, * in the Vale of Ewias, at foot of the Black Mountains. In that romantic spot Bishop Urban consecrated a chapel or hermitage of Ernisius, chaplain to Maud, Henry I.'s consort. In 1115 this gave way to a priory founded by Hugh de Lacy, Earl of Hereford, for forty canons regular of the Order of St. Augustine, dedicated to SS. Mary and John the Baptist. But owing to troublous times most of the friars sought refuge in the new Priory of Llanthony, which Milo, Hugh"s nephew, established for them at Gloucester. The parent foundation rapidly fell into decay; that on the Severn prospered so well that its value was 748*l.* (*teste* Speed) at the Suppression; whilst Llanthony, in Monmouthshire, had but 95*l.* yearly. There are views of the ruins in the "Antiquities of Great Britain," by T. Hearne and W. Byrne (1807) and, with a plan, in Coxe's "Historical Tour in Monmouthshire" (1801)—those in the latter work being after drawings by Sir R. C. Hoare, Bart. The church is cruciform on plan, and in many respects similar to Llandaff Cathedral. At the Dissolution, Llanthony was granted to one Richard Arnold. In the last century it belonged to the Earls of Oxford; it then passed to Colonel Wood, by purchase from Lord Oxford, and then to Walter Savage Landor, the eminent author.

THE Dean of Canterbury, in his capacity as co-trustee for the preservation of Richborough Castle, makes an appeal for a sum of at least 300*l.*, which is yet required for securing and protecting the site and the ruins, an amount of 1,070*l.* having been already subscribed to that end. In a "Note," on September 2, 1893, we described the construction and present condition of this historical monument, which, as Dean Farrar justly avers, is so full of interest, and beyond question ought to be placed in safety as one of our national possessions. Rutupiæ was the name given, jointly, to the two havens which were situated at either end of the estuary which separated Thanet from the mainland: the other haven was Reculver, built by Severus, to whom the Portus Rutupinus, the Saxon Reptaceastre, also is attributed (see Hasted's "Kent," Vol. III.). To repel the Saxon depredations by land and sea, the Second Legion, known as the "Augusta" or "Britannica" Legion, was brought hither from Isca Silurum, or Caerleon, in 368 A.D., and formed the garrison until the Romans finally quitted our shores. Tacitus records the arrival here, with his fleet, of Agricola, who started hence upon his coasting expedition round Great Britain; and to Richborough he returned. To what we have already said we may now add that a burial-ground discovered on a broad hill of sand, about two miles distant, near Gilton, in Ash parish, is supposed to be that of the ancient settlement; and that outside the castrum north wall has been found, by the riverside, a platform or landing-stage, built of square tiles, and leading to the Wantsum.

* The name is a corruption of "Llan-Dewy-nant-Honddu," the Church of St. David on the Honddu.

A CORRESPONDENT writes:—"In the Birmingham Municipal Art Gallery there has been for some years a model of the Birmingham Town Hall, which is little known, and is worth inspection by architectural visitors to Birmingham. The model was made in ivory to $\frac{3}{16}$ in. scale, by Mr. Philip Barrington. Detailed drawings were prepared for every part of it, and every piece of ivory is a model of the corresponding block in the building. The capitals, columns, and cornices are minutely finished after the original detail. Each column is fastened with steel spindles through its entire length, and screwed securely to base and entablature. The windows and doors have been cast in moulds and filed out of gilding metal. The roof, in exact imitation of the original, is covered with fine sheet lead. It is computed that the model consists of not less than 25,300 distinct pieces."

WE have received some samples of a paint called the "Marpedo Washable Water Paint." The paints are supplied in the form of thick paste, which, thinned down with hot water to the consistency of ordinary paint, have good covering power, and dry quickly, though the thorough setting or hardening of the surface takes some time longer. We have tried them on wood, cement, stone, and brick surfaces with satisfactory results; and we should say that those who require a cheap, easily-applied paint in place of ordinary distemper will be well satisfied. The paints will not resist sulphur-laden atmosphere without considerable darkening of colour. Acids, also, decompose them rapidly. We should consider them to be especially suitable for the interior decoration of churches, schools, and other public buildings; the manufacturers claim, however, that they are equally suitable for exterior work, "being impenetrable by rain, and unaffected by atmospheric changes."

A CHARACTERISTIC debate took place in the Dover Town Council last week in reference to a proposal to adopt a new code of building by-laws, when Alderman Pepper (the Deputy Mayor) moved "that the new by-laws be not approved." From the report of his speech we gather that the by-laws had been drawn up in accordance with the Local Government Board model, and that Alderman Pepper and various members of the Council disapproved of them because they were a great deal too good. Alderman Pepper, indeed, gave as the reason for his motion that the Council was a municipal body, and "not subsidiary to the Local Government Board like Boards of Guardians," but it is pretty evident from the discussion which followed that there is a great tenderness in Dover for jerry-building and jerry-builders, Alderman Pepper remarking upon the "injudicious" way in which certain persons had talked about "jerry-building." Another member considered that the by-laws were quite unfitted for Dover, and "would only cause friction if adopted"; which means, we presume, that a number of persons would be determined to evade them. Councillor Thorpe spoke up strongly in favour of the by-laws, and on the disgraceful way in which building was carried on in Dover; but Alderman Pepper's motion was carried, and for the present the jerry-builders of Dover may carry on their work unmolested. The result does not seem creditable to the Council.

THE Annual Conversazione of the Architectural Association was held this year at the King's Hall, Holborn Restaurant, on Friday the 25th. There is not the space here that there is at the Queen's Hall, where the last year's assembly was held, and the room seemed a little crowded for a promenade entertainment, but the evening was very successful on the whole. During the early portion of the evening the guests were formally received by the President and Mrs. Caröe. The musical part of the entertainment consisted of some very good performances by the Rebec Orchestral Society, alternated with the Pierrot Banjo Team, who are artists in their way, though one or two of the songs given as encores, or one at least, savoured too much of sheer music-hall-ism, which, to our thinking, ought to be considered beneath the level of entertainment for a society like the Association. In the vestibule were a number of objects of interest. Mr. Walter Crane lent some of his sketches of ornament, in white or brown paper, which were used to illustrate his paper at the Association, and some of which have appeared in our pages. Messrs. White, Allom & Co. lent a very interesting Renaissance chimney-piece from Wren's house; Messrs. Morris & Co., Stalman, and Essex & Co. lent tapestries and wall-papers (some of the silk hangings by Messrs. Morris & Co. were superb), and Messrs. Vickers & Co. lent specimens of ironwork. Among the drawings exhibited were work executed by Mr. Triggs as A.A. Travelling Student; measured drawings of Ramridge Chantrey, St. Albans, by Mr. Rider Smith (Jas. Brooks Prize); measured drawings of Cromwell House, Highgate, by Mr. A. Bryer (measured drawings prize); sketches by Mr. H. C. R. Hide, winner of the Andrew Oliver first prize, and by Mr. A. J. Roddis, winner of the second prize. Studio drawings of work done in studios were exhibited by Mr. N. C. Bathurst and Mr. C. Martin, who gained respectively the silver and bronze medals in Division I.; by Mr. Trimnell and Mr. H. C. R. Hide (silver and bronze medals in Division II.), and by Mr. J. R. Stark and Mr. J. Hunt, winners of similar medals in Division III. Photographs were lent by Mr. Wonnacott and Mr. J. P. Clark, as representing the Architectural Association Camera Club. It may be added that the refreshments, when obtained (the waiting staff was rather inadequate), were a decided improvement on those of last year.

LETTER FROM PARIS.

THE late great painter Meissonier, whose vanity was as great as his genius, would probably have been gratified at the honours paid to his memory. The town of Poissy had already raised, last year, a fine statue to his memory—that by M. Frémiet, an illustration of which has been published in the *Builder*;* and on Friday the 25th a select audience attended, at Paris, the inauguration of the second monument to him, erected in the Jardin de l'Infante, near the Louvre, opposite the Pont des Arts, and facing the monument to Raffet.

The new monument is in white marble. The sculptor, M. Mercié, had at first the idea of representing Meissonier borne aloft on a shield by four dragoons. The subscription committee, however, thought that this would have too much the air of an apotheosis, and that the honours of

* In the number for July 6 of this year.

Design for Panel in a Frieze. By Mr. Patten Wilson.

a military triumph could hardly be offered to an artist, however eminent; it was thought that it would be an exaggeration which might give rise to ridicule. Accordingly, the scheme was reduced to a more modest one. Meissonier is represented in his studio, in a painting-gown, as represented in his portrait of himself exhibited in 1889. He is seated in a large arm-chair in that Renaissance style which he loved so much. Leaning on his right arm, he rests his head on his right hand, in an attitude of meditation, while the left hand, holding the palette, drops carelessly on the arm of the chair. The pedestal, also of marble, is adorned with a trophy formed out of the accessories employed by the painter in his principal pictures of the Imperial epoch; a cuirass pierced by bullets, a helmet, the traditional small cocked-hat of Napoléon, a flag, a sword, &c. The work, executed in a broad and grand style, is powerful and finely proportioned. It seems doubly effective in contrast with the severe architecture of the Louvre, in comparison with which the Raffet monument, with its slender column, has, on the contrary, a somewhat starved appearance.

By way of emphasising its respect for the deceased artist, the Department of the National Museums arranged that the installation at the Luxembourg of the small bronzes presented to the State by Madame Meissonier should take place concurrently with the official inauguration of the monument. These statuettes, cast by the *cire perdue* process, were modelled by Meissonier with marvellous talent. There are five of them: two equestrian figures representing Maréchal Duroc at the Battle of Castiglione; a trumpeter of the period of Louis XIII.; a little figure of a dancer; a wounded horse which figures in the foreground of the picture of the Siege of Paris; and a design for a mantelpiece for his studio in the Boulevard Malesherbes. These statuettes are temporarily placed among the pictures, but will ultimately have a situation found for them in the sculpture gallery of the museum.

Meissonier, who possessed remarkable gifts as an animal sculptor, almost always, before painting a picture, made models in wax of the principal equestrian figures. It even appears (and this fact is very little known), that to assist these preliminary studies he got the sculptor Geoffroy Dechaumes to construct for him a very careful model of the skeleton of a horse, to a very small scale, the various parts of which were movable, and could be taken to pieces at pleasure. This enabled the painter to build up the model of each horse in the position in which he wanted it.*

* This is surely an interesting commentary on the celebrated definition of genius as "an infinite capacity for taking pains."—Ed.

The monument to the memory of Emile Augier, the poet, in the Place d'Odéon, was also to have taken place last week, but the ceremony has been postponed to the 4th of the present month. The monument, however, is in its place and almost completed, and one can at all events see that it will not injure, as was feared, the effect of the Théâtre de l'Odéon. It is a very simple design, consisting of a column about three mètres in height, on a pedestal formed by two circular steps, and supporting a bust of the poet. Around the pedestal are grouped allegorical figures, which, as well as the bust, are the work of M. Ernest Barrias.

At the Parc Monceau, the monument to Bizet, the composer, will soon be inaugurated. It is the work of M. Falguière, who is now engaged in putting the last touches to it. It will consist of a large mass of white marble 3 mètres in height, rough and simulating a natural rock, with branches of laurel strewn over it, and surmounted by a bust of Bizet, to whom a youthful figure of a Muse stretches a palm branch. A girl in Spanish costume, seated at the foot of the block, recalls the figure of Carmen. The plinth has been executed under the direction of M. Chas. Garnier.

The question of the Metropolitan Railway seems to have got into its last and decisive phase. The Government, which is anxious above all for the success of the 1900 Exhibition, will give up its first scheme, and has recognised the right of the Paris Municipality to carry out the work on its own plan as a simple "local railway" undertaking. This is a great step towards the realisation of the project. The Government demands only that the Municipal Council should consent to the establishment, before 1900, of a prolongation of the Moulineaux railway as far as the terminal stations of the Lyons and Orleans railways. According to this new scheme, the financial contribution of the leading companies is to be nine million francs, six million in money and three million in engineering work. The junctions with the Lyons and Orleans railways will alone cost 1,500,000 francs each. The Municipal Council will shortly take into consideration the new proposals and the study of the system of city lines which it has already adopted in principle a year ago. This system will include the following lines:—An east and west cross line from the Bastille to the Gare des Invalides by the Place Walhubert, the quays, and the Boulevard St. Germain; a north and south cross-line by the Gare du Nord, the Halles, the Quay Conté, and the Quay des Grand Augustins and the Place Medicis; a line from Rue Reaumur to the Gare St. Lazare, passing by the Parc Monceau, following the Avenue Hoche and the Trocadéro, and stopping at the viaduct of the Boulevard de Grenelle.

In regard to the 1900 Exhibition, according to a financial combination proposed by the General Commissioner, and which will presently be laid before Parliament, the Government proposes to institute next year a public issue of bonds of 20 francs which will guarantee to the subscribers certain advantages. The subscriber will receive the value of his bond in the shape of twenty one-franc entry tickets to the exhibition. He will also have the advantage either of entry to the special spectacles in connexion with it at a reduced price, or of transport to it at reduced fares. He will also have a number of chances in important lotteries, among which will be five lots of 500,000 francs each and twenty-four lots of 100,000 francs. It should be added that foreign holders of these bonds will enjoy the advantage of the reduced fares from the moment they cross the frontier.

The Municipal Council, whose session has just opened, have commenced the preparations for two pieces of work long looked for in the artistic world. The first is in relation to the Church of the Trinity, the façade of which has long been in a deplorable condition. The four fine groups in stone, at the base of the campanile, are nearly all headless. These groups, representing Strength, Justice, Prudence, and Temperance, are the work respectively of Jacques Maillet, Cavelier, Crank, and Carpeaux. The last-named is a specially fine production. At a comparatively small cost these sculptures are now to be restored under the direction of a talented sculptor, M. Rolard. The second operation referred to is the repair of the two graceful figures of angels, also much decayed, which adorn the side arcades of the tower of St. Germain d'Auxerrois, and which were the work of Guillaume and Cavelier. M. Desvergues, a former holder of the Grand Prix de Rome, is entrusted with the commission.

In regard to the group by M. Bartholdi, "Washington and Lafayette," intended for the Place des Etats-Unis, it has been decided, in accordance with the wishes of the American colony in Paris, that its inauguration should be deferred till February 6 next, the anniversary of the day on which France recognised the independence of the United States, or perhaps to the 27th of the same month, the birthday of Washington.

The Municipal Council has also been occupied about a scheme which, while it will no doubt be a public benefit in one sense, will be a great injury to the effect of some of the Paris streets. The proposal, which emanates from an architect, M. Teulère, is to construct foot-bridges across some of the more crowded portions of the Paris

streets, where the traffic is not regulated by policemen in the admirable manner in which it is done in London. The Paris "Gardiens de la Paix" are notoriously very much at sea and of very little use to anyone in the midst of an inextricable crowd of vehicles. The bridges, it is proposed, should be of steel and wrought-iron, the footway of wood, the supports of cast-iron. If the Council decide in favour of the scheme, the first trial of it will probably be made at the angle of Rue Lafayette and Rue Drouot, known among the Parisian public as the "Carrefour des écrasés," in consequence of the numerous accidents which have happened there.

Speaking of Rue Drouot, we may mention that the competition for the new buildings in that street for the *Figaro* journal has been decided. The jury has awarded the first premium to M. Arnaud, the second to M. Deperthes, and the third to MM. Bluysen and Chesnay; an extra third premium to MM. Schoelkopf and Boutron, with "honourable mentions" to other competitors. The four premiated designs become the property of the *Figaro*, and will serve as the basis for a final plan to be carried out, in accordance with the programme, by M. Sauffroy.

M. Viollet-le-Duc, the son of the great Viollet-le-Duc, who has directed very ably the Service of Monuments Historiques, has resigned his post, and has been replaced by M. Lucien Pâté, an eminent writer on art.

The death is announced of M. Jules Paul Lœbnitz, to whom the Société Centrale des Architectes awarded, in 1878, the medal founded in the same year by M. Paul Sédille, in favour of Industrial Art. Jules Lœbnitz belonged to a family in which the best traditions of work in faïence had been long hereditary. He was regarded by architects as a valued collaborator in any application of ceramic work to architectural decoration, and was remarkable both as an artist and a man of science. He was a former member of the Tribunal of Commerce of the Seine, was President of Union Céramique of France, and was created Chevalier of the Legion of Honour in connexion with the Exhibition of 1889.

DESIGN FOR PANEL IN A FRIEZE.

THIS graceful design was worked out by the artist, Mr. Patten Wilson, in a coloured drawing exhibited at this year's Royal Academy. The *motif* is so simple as to require no explanation. In the original drawing the foliage, though conventionalised in design, is treated with a considerable approach to the natural green of vegetation. The figure has on a blue mantle, indicated as semi-transparent where it falls close on the figure, as over the right leg, but for the most part showing as a tolerably strong blue. Owing to the well-known tendency of blue to weaken and probably disappear in photographing, the dress of the figure thus appears in the reproduction as light against a darker background, whereas in the original drawing it shows as stronger than the background. It seems right to mention this unavoidable alteration of values, though in a general sense the translation into black and white has not altered the essential quality of the design.

ABOUT SOME EXHIBITIONS.

THE managers of the Institute of Painters in Oils, whose exhibition is now open at the Piccadilly Galleries, seem at last to have seen what every one else has seen for a good while back—that their exhibitions have hitherto shown too much of quantity and too little of quality; and while they have wisely reduced the number of works hung, and not attempted to cover the whole of the walls up to the cornice, they have succeeded in getting, even among this reduced number, a better general level of merit than on previous occasions. Among the larger pictures Mr. John Collier's illustration of the Scottish Girl on Halloween (82) standing with her back to the spectator to see the face of her future husband look over her shoulder in the glass, is most successful in every respect: the girl's frightened attitude, clinging to the chest of drawers and half drawing away, and her scared face in the glass, are dramatically conveyed. There seems, however, to be an inaccuracy in the rendering of the superstition, because, properly speaking, the apparition shows itself as the experimenter is in the act of eating an apple before the glass, whereas here the apple lies uneaten beside her; but this reading certainly would not do so well for representation in painting. The President sends a rather larger work than usual, "Portia" (281), as fine as usual in colour and costume, and we regret to say, not more interesting than usual in the painting or expression of the face; he also contributes a carefully-executed landscape, "Newhouse Park, St. Albans" (180), with the house in the background, which looks rather like a commission for a topographical picture. Mr. T. B. Kenington's large work, "The Lure" (361), a painting of a nude siren sitting among the wreck of her human victims and with a shadowy skeleton behind her, if rather whimsical in conception, shows, at any rate, an excellent piece of painting and drawing of the figure. These are the prominent figure pictures; among the smaller ones M. Fantin-Latour's "L'Aurore et la Nuit" (126), is a fine bit of colour; M. Chevallier Tayler has two good life-sized portraits of ladies (118, 131); Mr. John R. Reid's "The Bread-Winner" (317), a dancing-girl rehearsing before her parents in a corner of a tea-garden, is a clever and spirited work, and Mr. Cameron's "Making Friends" (332) is a very pretty rustic idyll, to which a certain extra interest attaches on account of its individuality of style. There are other figures of the *genre* type, by old and well-known contributors, which are of average interest. But in landscape the exhibition is stronger, and contains some very fine works. It will interest many who have appreciated Mr. R. W. Allan's fine and broad style and powerful effects of colour in works of a different class, to find him in "Evening" (11) indulging in landscape pure and simple, and exhibiting in it the same fine qualities which he has shown in his town subjects. Mr. F. G. Cotman, in "The End of the Harvest" (70) recalls to us some of the best works of his father; in "The Water-cart" (79) Mr. Thorne Waite shows a broader and more powerful style than in his usual beautiful but rather sentimental work; Mr. Wimperis recalls Constable in "The Way Across the Fields" (213); among other landscapes which should be looked at are Mr. Joseph Knight's "Sandhills" (51); Mr. Johnson's "Markfield Mill" (63), Mr. Pickering's broad study of wooded landscape (97); Mr. Claude Hayes's "Morning in the Meadows" (125), an interesting attempt at a very difficult feat, the representation of a misty morning with a profusion of dew on the grass; Mr. Herbert Marshall's "The Embankment, Winter" (143), a fine repetition, on a larger scale than usual, of an effect he has painted rather often; Mr. Wetherbee's semi-decorative little picture called "A Spring Dawn" (190), interesting from its special treatment and idea; Mr. R. D. Reid's "A Pastoral" (203), a leaf out of Mr. H. W. B. Davis's book; Mr. Cotman's "Shades of Evening" (205); Mr. Hope M'Lachlan's "A Midsummer Sea" (247); Mr. R. W. Allan's picture of desolate "Cromarty" (319); Mr. John R. Reid's "Spring's Delights" (333), a real spring landscape — some others in the Gallery which are called "Spring" do not by any means suggest that season of the year;—"Mr. Jas. S. Hill's "Near Deal" (367); Mr. Hope M'Lachlan's "Night" (384), a very powerful bit of effect; Mr. J. Farquharson's carefully-studied painting of "Ice-worn Rocks, Loch Hourn" (396); Mr. Johnson's "Corrie na Creach, Skye" (447); and Mr. Joseph Knight's "Cerrigan Head" (475), of which the sea is hardly a success, but the rocks are grand.

All these are landscapes worth looking at, and that is a pretty good list for one exhibition, as things go. Of architectural subjects there are not very many, and hardly of the first order; we may mention Miss S. Stanley's "Exterior of St. Mark's" (72), Mr. Fulleylove's "Columns of St. Mark" (169), and Mr. Logsdail's "Church of the Misericordia" (179), the best of the three.

At the Dowdeswell Galleries in Bond-street is a collection of water-colour drawings by Mr. Wimperis, chiefly in and about the New Forest; drawings for the most part on a small scale, but admirable examples of that old broad English water-colour style of which Mr. Wimperis is one of the last remaining practitioners. The exhibition contains sixty-nine drawings, all in a good style. Among those which are especially good may be mentioned "The Path by the River" (1), "A Country Lane" (14), "Evening Shadows" (30), "A New Forest Upland" (36), noticeable for its fine stretch of distance; "The "Miller's Carts" (49), a beautiful bit of colour effect; "A Glade at Highwood Heath" (57), with the effect of the red heather beautifully conveyed; and a small drawing "Moor at Inkpen" (53), which is grand in character — a great landscape-painting on a small scale.

Mr. McLean's gallery is of rather partial interest; the best works in it are apparently old ones. Saint-Pierre's "Diana" is a noble work as regards figure-drawing; the dogs also are splendid in character and spirit, but one's pleasure is spoiled by the dead colour and want of texture of the flesh. It belongs, in this respect, to the practice of a past school; Rondel's bust, entitled "The Blonde," near it, is an effective contrast in this respect, though a quite inferior work otherwise. We are glad to meet again Mr. Peter Graham's fine landscape, "Wind and Rain," exhibited some years ago at the Royal Academy under the simple title, "Wind"—possibly the rain has been put in since. Sir E. Poynter's half-length "Barine," a classic lady crowned with crimson flowers, is, we fancy, a work of a good while past. The exhibition contains good examples of the work of Clays, Eugène de Blaas, Mr. Wimperis, Madame Dieterle, &c.

Of the Society of British Artists we fear there is not much to be said; it does not improve. There are some pretty good landscapes; Mr. E. A. Fellowes Prynne contributes a good piece of decorative painting, "Ecce Ancilla Domini," very hard in style certainly, but that is of less consequence in decorative painting; the ex-Secretary, Mr. Robert Morley, continues his animal studies successfully, as in "Defied"; Mr. Wyke Bayliss contributes architectural subjects which are well-drawn and correct in detail, but in a style which does not attract us; Mr. Arthur Mead gets a good effect of "open-air" in "Sea-Urchins"; Mr. Reginald Smith and Mr. Gouldsmith show two or three seapieces in which there is a good deal of movement; and a screen of landscape-sketches, travelling sketches apparently, by Sir F. Leighton, forms a special feature in the collection.

Probably the chief popular interest of the week in exhibitions will centre in the Society of Fine Arts Gallery, in which are to be seen the pastels of Mr. E. A. Abbey, and the "Trilby" studies of M. du Maurier. In regard to the pastels, Mr. Pennell, in a rather conceited preface, which has a kind of tune of "I admire all these and therefore every one must" about it, sums up certain advantages of pastel as follows:—

"I do not know how old the art of pastel is, nor do the various authorities whom I have consulted. But the art of drawing with coloured chalks is as old as the art of painting itself. In fact, a pastel is a chalk pencil made of various colours, and of varying degrees of softness. Those employed to-day are probably the most delicate and sensitive of artists' mediums. They are pencils of colour and of every variety of colour which the artist wants. There is no mixing them with oil or with water, for they are mixed. There is no waiting for them to dry and then seeing what unexpected effect they will present, for they are dry. Once they are put upon the rough-toothed coloured paper, they stay there just as they are. There is no varnishing to bring out the colour, and no restoring is wanted, since the colours never fade. There is no oil in them to turn them black, nor will the sunlight bleach them out. One has but to see the chalk drawings of the old masters to realise that very often the colour has resisted time and the vandal more successfully than the paper. . . . Some people seem to fear that pastels will crumble or fall to powder within their frames. Even those by Liotard, which are worked far more solidly—the colour loaded up on them—than Mr. Abbey's, reveal no evidence of such a fate. It is scarcely possible that they were fixed, and yet they do not crumble. To-day, a perfect method of fixing the colour to the paper has been perfected, and there is not a doubt that these creations of Mr. Abbey's will last as long as the paper upon which they were drawn."

We have quoted this evidence, as it may be interesting to those who think of trying pastel. Mr. Pennell does not touch on the obvious drawback—that your range of colour is somewhat limited, and that graduated colour is a difficult achievement. Look at the foliage background in Mr. Abbey's "Summer Afternoon" (8), for instance, with its crude blue shadows, and see if it does not a little suggest landscape in woolwork. But most of Mr. Abbey's pastels depend mainly on figures for their interest, and for the rapid realisation of ideas in the conception of figures pastel has great advantages. There is plenty to look at in the Exhibition, as might be expected; a charming vivacity both of effect and action in "An Impromptu Dance" (7); a beautiful bit of figure and drapery design in "The Dancing Girl" (13); delightful humour and character in the representation of Bob Acres and David (20) looking at the "challenge" epistle, and in the perfect realisation of "Mr. Croaker" (22). "Miss Lydia Languish" (19) is too serious and too sensible for the character. There is a fine solidity of effect in the half-length figure, entitled, "In a Garden" (39), which stands out so solidly from the back-

ground. The collection generally is worth study, both for the humour, the character, or the grace of many of the figures, and the examples which it affords of the capabilities of pastel.

In the adjoining room M. Du Maurier's studies for the illustrations to "Trilby" will no doubt attract great attention, and are of more interest in an artistic sense than we had quite expected. They are not the facsimile ink-line drawings for the illustrations as appearing in the book, but the pencil studies made, on a larger scale, for the separate figures in each illustration; the book-illustration with its title is introduced into each frame, as an explanation of the separate pencil studies. These show what care the artist has given to the preparation of these small illustration groups, and form a collection of most interesting studies of human character and attitude. The run which there has been on the book itself—save that it is the work of a very popular artist—we do not profess to comprehend; "Trilby" appears to us to be a collection of excellent materials for a novel, jumbled together by a writer who has no perception whatever of literary construction and perspective; and it is odd that artists should not see that writing, as far as literary form goes, is a special art just as much as designing, and cannot be attained without natural perception aided by special study. But the studies for the illustrations to it are very well worth attention.

MODERN BUILDING DESIGN.

On the 26th ult. the first of two lectures on the study of architecture, arranged by the Technical Education Board of the London County Council, was given at the Central Art Department of the Board, Bolt-court, Fleet-street, E.C., by Mr. W. R. Lethaby, who took as his subject, "Modern Building Design."

Doctor Garnett, in introducing Mr. Lethaby to the meeting, said that there seemed to be points in which it was thought that the education and thereby the practice of the architect might be improved, and in his opinion architects' pupils might with advantage be brought more into contact with the workman than they are at present. It had been said very properly that the architect was the chief workman on a structure, and therefore the architect should take his position as such. The education of architects' pupils might be improved if those pupils were brought more closely into touch with work in the workshops, and to that end an attempt had been made in London to secure facilities for them to enter the workshops in the technical institutes and Polytechnics, so that even if a pupil did not learn much about the actual use of the tools, he would at any rate have the run of the shops, get more in touch with the workmen, and see the operations in connexion with a piece of work from beginning to end. Two or three technical institutes had already come forward and offered facilities in this direction.

The following is an abridged report of the main points of Mr. Lethaby's lecture. He observed that his lecture had been occasioned by the following facts:—The Polytechnics had from the time of their foundation been giving instruction in the building crafts, and it seemed that those crafts could only be dealt with in a broad and satisfactory way by being related to their common centre: the art of building considered as a whole. There were at present in the Polytechnic art schools and construction classes a large number of students of architecture, and his chief purpose was to suggest to those students and others that the practical workshops in masonry, joinery, &c., conducted at those centres would form a valuable basis for their studies.

They were there to think over the subject of building as one of the arts; and allowing that modern building was not now a subject of joy to the workers or the beholders, to consider whether this was a temporary transitional state or an inevitable one. He could not set out a view of building design four-square with all the facts. He could not come to any view as to what the word architecture was now supposed to involve, therefore would start with the less ambiguous word building. The word architecture had been most in vogue in times when beautiful building was least practised. "Ornamental building" would not serve as a clear definition; "expensive building" might, for they must find a place for the work on the Abbey and parish churches of St. Albans. But passing by some farmhouse built within the century or even some present-day cart-sheds and field-gates, thatched ricks and hay-wains, we realised that this poor but essentially interesting artisan work was really the latter-day remnant of the crafts that built our ancient towns, churches, and manor-houses. The gifts and devotion required to carry out a law courts, or a modern large school or hospital, appeared to him to be almost boundless. Wren's problem in St. Paul's was a simple one by comparison. But the unequalled skill of modern architects had not achieved a noble school of building, and true architecture was now non-existent. It was the gravest mistake to foster the idea that there was a sort of building called "architecture," superior in kind to ordinary building: the serious problem was how this "ordinary building" might be well done, for without that as a basis no higher building or "architecture" would be possible. There was no blame to be attached to the architects, who did for the public exactly what the public required, in a very capable way. But we had to consider how it was that the art of architecture had failed to interest intellectual men of the world from the early days of the Renaissance. The remarkable awakening of interest in industries as arts and in building as a phase of life during the last half century, had resulted in the discovery that art was as much a method as an end—machinery had shown us that. The more intellectual interest in building, and inquiry as to the true groundwork of the art, was linked as cause or effect with a better understanding of Gothic architecture. Hugo said, "Co-operative human intelligence is totalised in these works. The time was the architect, the people was mason." We might draw pointed arches and traceried windows and call them Gothic designs, but true Gothic architecture was built with Gothic mortar. Revived masons' marks, careful "accidents" in setting-out, sham time-stains as in new "thirteenth century" glass, were all miserable subterfuges; how were we to get our walling, our mortar, and a new spirit. Carlyle's father gloried in doing good work as a mason at a few pence a day. Thoreau said, "What of architectural beauty I now see, has gradually grown from within outward, out of the necessities and character of the dweller who is the only builder, out of some unconscious truthfulness and nobleness without even a thought for the appearance; and whatever additional beauty of this kind is destined to be produced will be preceded by a like unconscious beauty of life." Mr. Ruskin said, "These pediments and stylobates and architraves never excited a single pleasureable feeling in you—never will to the end of time. . . . All good architecture arises out of good and simple domestic work." Mr. Morris said, "The art that is to come will not be an esoteric mystery shared by a little band of superior beings; it will be a gift of the people to the people, a thing which everyone can understand and everyone surround with love. . . . A building is made up of millions of hammer-strokes, chisel-strokes, and movements of the hand. Because a man sits in an office and makes a design, it does not follow that you get a fine building." In France, where, for two centuries, there had been a magnificently appointed academic system for teaching what was called architecture, the result was acknowledged to be dry, futile, and dead.* Vital beauty could only be present in building when the character of the design sprang out of the contact of tools and material, and was not the result of compilation in codified scholarship. What was taking place around us was the re-establishment of several crafts under the personal conduct of the designers. The expert in the arrangement of highly-specialised buildings like the hospital, the club, or the asylum, would have the co-operation of master-builders and craftsmen, experts in workmanship and expressive design, and a very large part of ordinary building would be done by them out and out. Here they had a basis for a broad school of experimental craft which would be in touch with the whole of building. The architect-arranger must then content himself with arranging and give up ornamental detail, calling on the free sculptor, painter, metal-worker, and so on for all accessory arts. All along the line attention to design was being incorporated with technical instruction, and the system would certainly not arbitrarily stop short of the building crafts. The time was coming when such architects as felt drawn to the mere act of building would not think there was any difficulty or degradation in such a course; they would just build. The thought that the development of the designer of building work (as apart from the worker) has not been a mere passing phase but is in the nature of things modern, was largely based on a misconception. The point was, were designers to develop from workers, or was the designer to be produced in quite a different way by substituting a knowledge *about* work for a knowledge *of* work? They were probably agreed in wishing to make all building more interesting by means of the workmen becoming more capable and more interested, and all would allow that building designers should be brought into contact with materials, and the methods of working them, as much as possible.

What did the past tell us in regard to the view that experiment with materials was the only basis for a positive style of building? Mr. Mahaffy said of Athens and her artists, Here, as in other great epochs, art and trade went hand-in-hand; the artist was not a grandee but a tradesman." In Rome, Ephesus, and Constantinople the guilds of the workers became powerful, and gave craft an organisation which persisted down to the later Middle Ages. The designers and builders of our cathedrals were graduates of craft colleges or guilds. At St. Stephen's Chapel at Westminster "Master Thomas of Canterbury, master mason," was engaged at a shilling a day, or twice the wages of an ordinary mason. In the present day, the first thing we needed was a wider general understanding of what went to make good building. In the Middle Ages an abbot or a soldier would very likely call in a master mason, and say, do you think you could build a church, or a castle, like so-and-so, only bigger and nicer? The Renaissance, which freed Learning and made Science experimental, set Art to grimace in a pillory. Wren, the greatest mind that had dealt with building since Michelangelo, saw exactly what was to be got out of the Renaissance box of bricks, and the personal humanity and gracefulness that showed under the bigwigism of the style and lighted up his science and scholarship were marvellous. The "last of the Romans" in England, he closed that gate as effectually as Michelangelo did in Italy; but at St. Paul's, with admirable craftsmen to help him, his position was rather like that of a Mediæval master. After Wren came the drop-scene art of Vanbrugh and the pedantry of Chambers. It took scholarship two hundred years to destroy all building tradition, and then we had Pugin, who, like Seth in the apocryphal gospel, retraced the steps of the fallen on the blighted ground, and looked wistfully through the gates of the old Eden. He would pass over the unworthy task which draughtsmen-designers had now set themselves of imitating styles neither imaginative nor scholarly. The cry was for "style," and the assumption was made that architecture was made up of features, or that it would be more possible with new materials. Not this or that material, but every one, was the best; the question of materials was only an economic one. The mistake lay in the endeavour to design style. Style was only a way of doing things, and as inseparable from activity as faith from works. As physical beauty was an index of health and natural living, so art was an index of natural and stable ways of doing work. The common habit of separating architecture into art and science without explaining what was meant by either, was extremely harmful. The scientific side was supposed to be a knowledge of books on construction, the artistic a knowledge of books about art, not considered as art, but as history, and so "art" led off with the pyramids, the catacombs, and so on.

Literature and art, *saying* and *doing*, were two ways by which men embody their souls; act, live. "Style, that is the man," ran the French saying. That turgid piece of clever vulgarity, Blenheim, was only another of Vanbrugh's plays, and the mind of Wren was open to us in St. Paul's. As we passed along the streets and read the faces of the buildings it was not because of mere shapes and colours that we made this fuss; we wanted to sympathise with the men behind, if they would only risk a smile in their work. Those who bespattered their buildings with thrice-boiled slime and crawling horrors they called ornamentation did it because they liked that kind of thing.

We could not understand architecture without learning to read it, but though everything led up to this, he did not think a builder could or should foresee the exact expressional result of his work; it should be a growth, not a creation. The expression of an old castle came by the way; the machicolations were not designed to frown, but they *did* frown. It was with a building as with a person; of one who carefully designed his expression we said that he was affected. "Expressionism," however, might best qualify what should be sought in design, and building could only be interesting when there existed a wide-spread ability to read its expressional

* By whom? The late Mr. Hamerton, who knew something about art, gave it as his opinion that, in France alone, was architecture still a living art. M. Daudet, whom Mr. Lethaby cited in a quotation which has already appeared in our columns, certainly had far less right to speak on the subject than Hamerton.—Ed.

results. No doubt through association, a church, even now, looked very like a church, a railway station like a station, and a gin-palace terribly like a gin-palace. The true mission of architects was by imaginative insight to lift these ideas themselves to nobler issues. The points he had endeavoured to suggest might be summed up as follows:—(1.) That all buildings carry their characters written on their fronts. (2.) That students of architecture must learn to read these documents, questioning the right to exist of this or that so-called ornament or feature. (3.) That this reading was proper criticism. (4.) That there were only two purposes for a building, service and delight, and that instructed pleasure could only be derived from a building when it fulfilled certain positive conditions. (5.) That there was now no general interest in building, because design was irrational and workmanship not pleasant. (6.) That those, not architects, who had taken the trouble to think about building, said very plainly that they had no pleasure in us. (7.) That there were only two methods of design possible, the fresh experimental work of an artist thinking in terms of materials, or the re-combination on paper of the results of old artisan work. (8.) That a small handiwork knowledge was so far better than none, but generally that a fine work of art could only be produced by a workman. (9.) That beauty was not a luxury, but was inseparably bound up with quality. (10.) That we who were selfishly interested in beauty could not content ourselves with less than the endeavour to bring back beauty to *all building*, and thereby beautify the earth and not desecrate it.

Mr. Lethaby's second and concluding lecture will be delivered to-day (Saturday) at the room in Bolt-court, at 3.30 p.m.

THE LONDON COUNTY COUNCIL.

The usual weekly meeting of the London County Council was held on Tuesday, at the County Hall, Spring Gardens, Sir Arthur Arnold, Chairman, presiding.

Advertisements on Hoardings.—The adjourned report of the Works Committee contained the following paragraph and recommendation:—

"The specification for the erection of Whitefriars Fire-station does not contain any clause prohibiting advertisements on the hoardings which will be erected to enclose the works. Our manager therefore prepared his estimate on the assumption that the Council would receive a large sum for letting the right of advertising on the hoardings. We have obtained an advantageous offer which, if the Council authorises us to accept, will considerably lessen the cost of the work. We recommend—

'That we be authorised to let the right of advertising on the hoardings about to be erected in Carmelite-street and John Carpenter-street, during the building of Whitefriars Fire-station.'"

Sir John Hutton moved the following amendment:—"That the recommendation be referred back with instructions to the Committee to amend its estimate, excluding the consideration of letting the hoarding for advertisement purposes."

Dr. Longstaff seconded the amendment.

Sir Blundell Maple said that he should support the recommendation of the Committee in the interests of the ratepayers. The Council might be able to obtain five or six thousand pounds a year in this way, which would help to reduce the rates.

Mr. W. Steadman supported the recommendation, remarking that advertisements like those of the Aquarium, for instance, were very much more pleasant to see than bare hoardings. He hoped that the Committee's recommendation would be carried, and that London would soon become one large picture-gallery.

Mr. Beresford Hope said that he had lived for seven years in front of a large hoarding, and it was a matter of interest to him to see the changing pictures. The amendment would mean taking four or five thousand pounds from the ratepayers' pockets annually.

Mr. E. Jones said that, as the Council did not allow advertisements on new bridges, it should be consistent and prohibit them on its own hoardings.

Mr. Roberts supported the amendment, and referred to some forms of public advertising as monstrous products of industrialism. He hoped the Council would not adopt a lower standard than did the City on that question. It was a deplorable fact that sometimes pieces of vacant land were acquired merely for the revenue to be derived from advertisements on hoardings surrounding them.

Mr. Cosmo Rose-Innes reminded the Council that many of the modern advertisements were very beautiful.

On a division, the amendment was defeated by 80 votes against 30.

Mr. Strong moved that the following words should be added to the recommendations of the Committee: "And that, in view of the question of principle involved, the whole subject of advertising on hoardings in connexion with the Council's works be referred to the General Purposes Committee for consideration and report."

With this addition the recommendation was carried.

The Wandsworth Technical Institute.—The Technical Education Board reported that at the Wandsworth Technical Institute the skating-rink, known as St. George's Hall, has been converted into laboratories, workshops, and class-rooms, under the superintendence of Mr. E. W. Mountford, F.R.I.B.A., at a cost of about 900*l*. A technical day school for boys has been opened, and is conducted as an organised science school. In the evenings classes are held in carpentry and joinery, staircasing and handrailing, brickwork and masonry, machine drawing, physics, chemistry, mechanics, physiology, hygiene, and other subjects. The Board also reported that at the Battersea Polytechnic three new workshops have been erected. These workshops will be used for carpentry and joinery, smiths' and foundry work, and electrical engineering. Simultaneously with the erection of these new buildings the large workshop adjoining the women's department, which was formerly used for carpentry and joinery, has been converted into a laundry.

Sanitary Science.—The Board also stated that the training of sanitary inspectors and others in sanitary science is receiving careful attention, and a joint Sub-Committee has been appointed by the Board and the Public Health Committee of the Council. This joint Sub-Committee is considering the applications which have been received from institutions interested in the teaching of sanitary science, and in the conduct of examinations for sanitary inspectors, and in order to secure unity of action is in communication with the Local Government Board on the subject.

London and Provincial Labour.—Mr. Holland moved:—

"That, while not desiring to restrict the general discretion of its Committees, the Council is of opinion that they should when inviting tenders for work (provided that such work can, in their opinion, be as well done in London as elsewhere) invite such tenders in the first instance only from firms having their works in the County of London."

Mr. Steadman seconded the amendment. He said that he was not in favour of promoting a contractor's ring in London, but he believed in giving London work to London workmen.

Mr. J. Burns, M.P., opposed the motion, and in doing so said that the motion was reactionary and retrograde. If it were carried, it would result in harm being done to the quality of London work and to the real interest of London labour. If the motion were passed, he believed that a ring would be promoted among London contractors, and work would be sent secretly out of London and would be done in the provinces at a low rate of wages.

Lord Farrar said he was in entire sympathy with Mr. Burns. One result of the motion would be to deprive London of some of the best work of the country.

Mr. Ward said one result of the motion would be that the Works Committee would have to get all its materials in London and all its work done in London, while outside builders would be free to go to the country. How, he asked, could the Committee compete with the builder under such circumstances?

The motion was ultimately lost, there voting for it 26, against 68.

Workmen's Dwellings and Lodging Houses.—Mr. Corbett moved, "That no further building, either of workmen's dwellings or of lodging-houses, be undertaken by the Council, seeing that such operations result in loss to the ratepayers, and by checking private enterprise tend to diminish instead of to increase accommodation for the working-classes."

The motion was opposed by Mr. Bruce, who pointed out that, so far from a loss, the Council's last buildings were showing a profit; and after a short debate the motion was rejected by a large majority.

Municipal Crematories.—On the motion of Mr. Organ, it was referred to the Public Control Committee to consider and report as to the advisability of power being given to local authorities to provide crematories.

The Council soon after adjourned.

DURHAM COUNTY BUILDINGS COMPETITION.

Messrs. Philip Tree and Ivor Price, who have been acting as secretaries for those competitors who wished to protest against the procedure of the Durham County Council in this competition, have sent the following letter to every member of the Council:—

"4, Ludgate Circus, London, E.C.
October 26, 1895.

Durham County Council Buildings Competition.

Sir,—At the quarterly meeting of the County Council, to be held on the 6th prox., you will be asked to give your final sanction to the erection of new county buildings, according to plans prepared by Messrs. Barnes & Coates, of Sunderland. Before giving your consent, we would respectfully suggest your receiving a detailed report from the Building Committee, giving reasons why these gentlemen have been entrusted with the work. Their design, submitted in the open competition inaugurated by you, was not considered by your assessor, Mr. Vickers Edwardes, of Wakefield, as even one of the six best, and yet they were awarded the second premium. This action was quickly followed by their being instructed to prepare working drawings for carrying out the work. The injustice which all architects, and we competitors in particular, complain of is, that the authors of the first premiated design, Messrs. Cooksey & Cox, of 4, Adam-street, Adelphi, London, W.C., have been unfairly deprived of their honourably won commission of carrying out the work, and that the gentlemen who were awarded the second place by your assessor have never been paid their premium, neither have they received any other recognition, while the carrying out of the work, which we were all led to believe would follow the first premium, has been given to a local firm who had no claim on it whatsoever.

The Committee's contention, that having paid for the first premiated design, they have nothing more to do with its authors, is a slur upon the profession at large, as no architect of repute would entertain the idea of competing merely to obtain a premium, their aim being to win and carry out their design. A protest from the Royal Institute of British Architects is being forwarded, which we hope will be read before the whole Council.

We now enclose a copy of the protest we competitors have sent signed by all the prominent men we know of who submitted designs.

The authors of the first premiated design and ourselves intend staying at the Rose and Crown Hotel, Durham, from the evening of the 2nd to the 7th prox., and we shall be pleased to supply any further explanation or details.

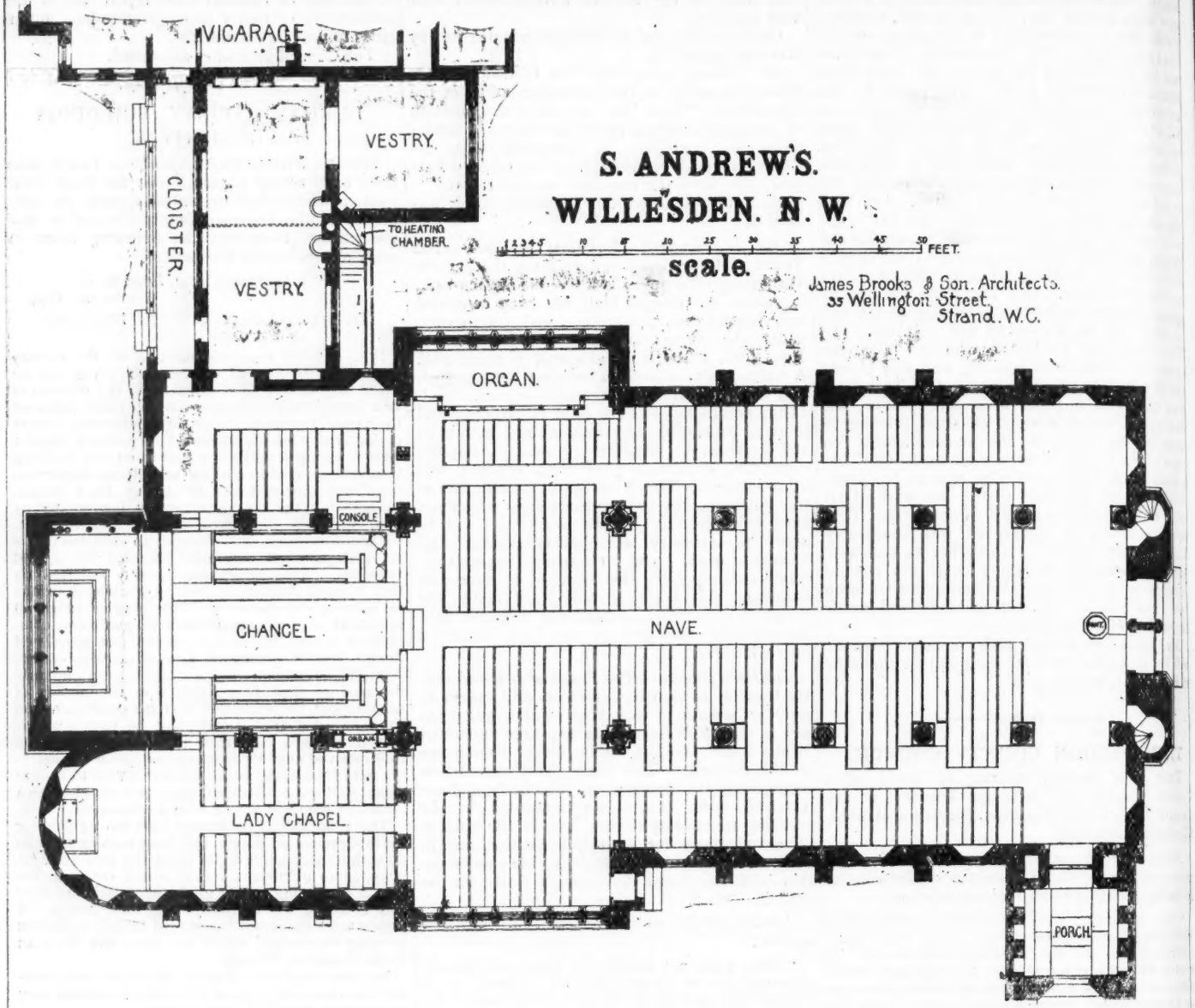
We are, Sir, your obedient servants,
Philip Tree & Ivor Price,
Hon. Secs. to the protesting Competitors."

This is a spirited protest, and it will be of some interest to see what reply it elicits from those to whom it has been addressed.

A NEW SYSTEM OF ELECTRIC TRACTION.

The Westinghouse Electric and Manufacturing Company is introducing into this country a system of electric traction which deserves careful consideration. There are no overhead wires as in the trolley system, which at the best can only be considered as a temporary arrangement, adopted for want of a better, and there is no slot either open or closed with a flexible cover as in conduit systems. The only difference in the outward appearance of the lines from that of an ordinary horse tramway is that about every ten yards there is a group of three rounded metal studs, each of which is about $3\frac{1}{2}$ in. in diameter and three-eighths of an inch high.

When no car is passing over them they are disconnected from the underground mains, and it is impossible to get a shock from them, and nothing would happen if metallic connexion were established between any of the studs. Underneath the cars are three metallic bars which establish rubbing contact with the studs. Two of these are connected with an underground electro-magnetic switch, which, when actuated by a current coming from a battery of three chloride cells carried by the car closes the main circuit. The other stud carries the current to the motors, and it is returned through one of the former studs. There are slight modifications of the system to suit different conditions, as, for example, returning the current by the rails, thus reducing the number of studs in a group to two. There



are two motors in each car, and they are controlled by a "series-parallel" controlling-stand, which is a model of ingenuity. By turning a handle the motors are started, with their fields and armatures in series, thus avoiding a sudden start; on turning it still further the resistance is diminished, until, finally, the two motors are in parallel, and are then working with high efficiency. At first sight it would seem that this system, involving as it does a large electro-magnetic switch about every ten yards, would be a costly one to construct, but the company say that its cost is about 20 or 30 per cent. less than existing conduit systems, and that the subsequent loss due to leakage is reduced to a minimum. At Pittsburg three miles of rails have been constructed on this principle, and at Washington, one mile, so that practical experience has been had of its working. At their offices in Victoria-street, Westminster, they are exhibiting a beautifully-finished working model tramway on this principle, which shows exactly how the "feeders" are laid, and how the switch works when the car passes it. They state that when applied to underground railway work, a speed of forty-five miles an hour can be attained, which is easy to believe after seeing the rate at which the model careers round the room.

Illustrations.

DESIGN FOR CHRIST'S HOSPITAL SCHOOL, HORSHAM.

THE general plan of this building, some of the detailed plans, and views of various portions of the separate buildings were given in our issues of June 16 and June 23, 1894. The design was described at considerable length in our leading article of June 16, 1894, as well as in a formal description from the architects in the succeeding number of this journal.

The present view is the large general perspective showing the *coup d'œil* of the whole group, which was prepared for and exhibited at the Royal Academy Exhibition of this year. At the time of our previous illustrations of the design there was no large or complete perspective view of it made, only a slight sketch to give a general idea of the grouping of the buildings. The present drawing supplies what was unavoidably wanting in the former illustrations. It is unnecessary to repeat the descriptions of the scheme which have already been given under the dates referred to above.

The architects, as most of our readers are aware, are Mr. Aston Webb and Mr. E. Ingress Bell. The execution of the scheme seems still to be adjourned *sine die;* but we hope that it may be ultimately carried out, both for the sake of the architects and in the interests of the public, as we believe it would turn out to be the best-planned large public school in England.

ST. ANDREW'S, WILLESDEN.

A SMALL view of this church, as proposed, from the east end, was given in our issue for January 2, 1886. The church has, however, never been completed. It is now proposed to complete it as shown in the present view and on the plan appended.

Since the church was commenced. a vicarage and schools have been built, and also a choir-school. The architects are Messrs. James Brooks & Son.

HALIFAX BANK COMPETITION.

THIS illustration represents the exterior and plan of the design by Mr. Mitchell Withers, of Sheffield, which gained the second premium in the recent competition for a new central bank for the Halifax and Huddersfield Banking Company, Limited, at Halifax.

The estimated cost of the building was 16,000*l.*, the amount allowed in the instructions.

An open semi-circular porch leads into a spacious vestibule with curved ends, and columns in various positions lit from a lantern in the top.

The banking hall is a large room, decorated with columns, and lit from both ends and from a central dome. Off the banking hall are accountants', manager's, and sub-manager's rooms, board-room, safes for bullion, plate, and books, with spare safes over, waiting-rooms, and lavatories, &c.

On the upper floors are rooms for caretaker, private rooms for manager, and ample store accommodation.

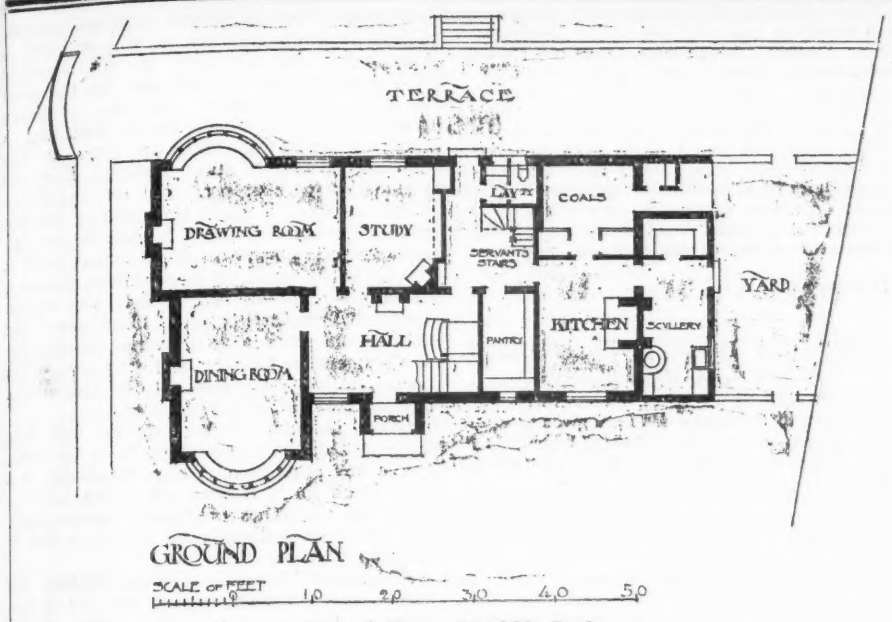
HOUSE AT WOODSIDE PARK.

THE two sketches of this house, recently completed at Woodside Park, illustrate the front and garden elevations: the latter shown in the small drawing. The effect of a frieze has been obtained in this by the natural grouping of first-floor windows with their shutters under the solid eaves, which are continued round on all four sides of the house.

The bay windows above the sill are polygonal on plan, and the whole of the external woodwork, with the exception of the oak doors to the front porch, are painted white. Red bricks and tiles of a deep colour have been employed. The design is by Mr. W. T. Walker, and the house has been erected by its owner and occupier, Mr. James Chapman. The drawing was exhibited at the Royal Academy of this year.

ARCHITECTURAL SOCIETIES.

DEVON AND EXETER ARCHITECTURAL SOCIETY.—At the Athenæum, Plymouth, on the 26th ult., a conference of members of this Society was held, the following being present:—Mr. Arnold Thorn, of Barnstaple (President), in the chair; Messrs. E. Appleton, J. Jerman, J. Crocker, G. S. Bridgman, A. Parker, Priestly Shires, H. E. Luff, E. G. Warren, O. J. Ralling, L. Tonar, W. H. Richards, Harbottle-Reed (Hon. Secretary), C. A. King, J. Greenwood, M. A. Bazeley, J. Paton, J. Dwelley, R. A. Mill, W. F. Bickford, Charles Cole, W. H. Borland,



Plan of House, Woodside Park.

J. Harvey, W. J. Carver, T. R. Kitsall, Perkins, A. J. Bewes, E. M. Leest, Pinder, C. Pinn, and A. Norman. The President, in opening the proceedings, explained that the object of the meeting was to consider a proposition from Plymouth architects to form a branch of the Society in the Three Towns. This was set out in a resolution recently passed by a meeting of the local professional men. In the discussion, Mr. Shires pointed out some of the social and other advantages accruing from a branch such as had been formed in other large towns. Sixteen Societies were now in alliance with the Royal Institute of British Architects, including several in the colonies; and he hoped that ere long a belt of them would be established around the world, giving enlarged opportunities for interchange of architectural ideas. He suggested the lines on which they should proceed. Mr. Crocker considered that Mr. Shires had fairly put the views of the Exeter members generally. Mr. Appleton was glad that they were anxious for local extension, and, as a member of the Devon and Exeter Society, he would heartily approve of Plymouth forming such a branch. Mr. Jerman said they could not expect Plymouth members to always come to Exeter for meetings, and there should be no difficulty in extending the work in the former place, in which they would have the support of the Exeter members. It was proposed by Mr. Shires, seconded by Mr. Luff, and unanimously carried, that a local centre of the Devon and Exeter Architectural Society be formed at Plymouth. Mr. Paton proposed that a committee of architects of the Three Towns be appointed to confer with the Council of the Devon and Exeter Society to carry the foregoing resolution into effect. This was seconded by Mr. Dwelley, and agreed to. A vote of thanks to the Chairman terminated the proceedings at the Athenæum. At the luncheon which followed, the loyal toasts were duly honoured. In reply to that of "The Devon and Exeter Architectural Society and its President," Mr. Thorn referred to the fact that the Society owed its growth (during the speaker's connexion with it), almost entirely to the efforts of Mr. Warren, who was now retiring from the post of Hon. Secretary; and as it had been considered by the members that these efforts should be recognised and some acknowledgment made, a subscription was raised. In handing the result (which took the form of a gold albert), to Mr. Warren, he desired him to believe that it was a mere symbol or mark of the feeling in which his services were estimated, and hoped he would accept it as such. Mr. Warren, in thanking the members, assured them that whatever he had done for the Society, he had, in the pleasure of doing it, amply repaid himself; and, further, his thanks were greatly due to the members for their courtesy during the past five and a-half years he had held office.

CARLISLE ARCHITECTURAL, ENGINEERING, AND SURVEYING SOCIETY.—The first ordinary meeting of the session was held on Tuesday last in the Town Hall, when Mr. F. J. Nickols, C.E., of the City Surveyor's office, read his Presidential address. The lecturer treated of wood-paving, the adoption of which is proceeding at a rapid pace in our large towns, especially since the introduction of the new woods Karri and Jarrah. After dealing with the different descriptions of wood-paving, the lecturer proceeded to discuss the creosoting of timber, many specimens being shown to the meeting. The paper then dealt with sanitary and sewerage matters, including the use of polarite as a water and sewage filtering material, and concluded with a comparison of the sanitary state of dwelling-houses and streets at the beginning of the present century and now. Mr. Ruthven, in proposing a vote of thanks to Mr. Nickols, referred to the good work Mr. Nickols had done for the Society as Secretary in its early years, and to the prominent part he had played in its inauguration. Mr. Hill, Sanitary Inspector of Carlisle, in the discussion, advocated the use of 5-in. drains for houses as a more suitable size than 4 in. or 6 in.

COMPETITIONS.

SCHOOL, PEMBROKE DOCK, PEMBROKE.—The Governors of the Pembroke Dock County School have selected the designs for the new school at Pembroke Dock submitted by Mr. D. Jenkins, architect, Llandilo, and have awarded the premium of ten guineas to him.

Correspondence.

To the Editor of THE BUILDER.

THE APSE AT RECULVER CHURCH.

SIR,—With regard to Professor Baldwin Brown's observations in the last issue, I should like to add the following remarks, knowing the ruins well, and having collected every print that has been made of the place during the last one hundred years.

The apse is clearly all Roman, the workmanship being executed in the neatest manner, and in the straight portions of walls two doors of access were present which had a single jamb for a timber door-case on the inside, all Roman workmanship. These doors continued unblocked and in use from the lengthened side aisles until the Reformation, when the ends of the aisles and these chancel doors were entirely plastered up. The concrete pavement in part existing, from which a writer in the last century was unable to break off a piece with a pickaxe, is identical in the space east of the pillars, as in the nave, but is some inches higher in the apsidal annexe. A very careful inspection of Pridden's internal view of the whole church when entire, as well as Hastrad's description, goes to show that the pillars stood upon the base of a rise of steps. The concrete Roman pavement is limited by the side walls of the nave and apse.

With regard to the pillars, they were spaced so that the central arch was much wider than those to each side; and in two views taken by different persons in 1809 during the wrecking effected at the instigation of the then vicar; one pillar is seen alone standing, the other disjointed and lying near; the arches above are seen neatly built in Roman tile, and show no signs of falling when the support is taken away; in fact, we know in this part of the edifice gunpowder alone took effect in levelling the walls. In the Church of St. Remi, Rheims, unfinished capitals similar to those formerly in Reculver can be seen built into the north transept; evinently shallow foliage in two ranges was intended. From these remarks it is evident that the Roman builders need not have hesitated to have, if they had so desired, constructed any width of arch. The late dry weather showed all the foundations of the church to greater advantage than commonly.

"F. G."

"PRE-CONQUEST ARCHITECTURE."

SIR,—Reading Professor Baldwin Brown's interesting papers on "Pre-Conquest Architecture," I notice he speaks of St. Pancras, Canterbury. Can he or some of your readers kindly tell me where it is—is it an old dedication of St. Martin's?

C. W. JEWITT.

SOMERSET HOUSE—A UNIQUE OPPORTUNITY.

SIR,—The sites of several shops at the corner of Wellington-street and the Strand have recently been cleared, and are now to be sold. If the Government could see their way to acquire these sites, and erect thereon an extension of Somerset House in harmony with the present front in Wellington-street, they would confer a great and permanent improvement on London, while economically providing themselves with much-needed further office accommodation. Such an opportunity will not occur again for a century. The neighbouring old houses will doubtless be coming down at no distant date, so that the opportunity will then be afforded of providing Somerset House—one of the chief national buildings—with a noble front in the Strand, extending ultimately from Wellington-street as far as the entrance to King's College. Such an extension could be carried out gradually, as the leases of the old houses fall in; the ground floor could, if thought advisable, be let as shops, and so produce income till such time as the Government found occasion to use them for public purposes. This proposed expenditure, so far from being a waste of public money for merely ornamental purposes, would be one of the most easily-justified from many points of view. It is notorious that further accommodation is required for the Government staff, many of whom are housed in cramped, unhealthy, and more or less temporary quarters; from the nature of the sites in question the whole ground would necessarily be covered with buildings, no space being wasted in open forecourts, &c. And by no means least in consideration would be the great adornment to the Strand—one of the most important streets of the capital—which the proposed extension would create.

F. W. G.

BRICKS, TILES, AND TERRA-COTTA.

SIR,—With reference to your review of "A Practical Treatise on the Manufacture of Bricks, Tiles, and Terra-cotta" in last week's *Builder*, it may interest you to know that a paragraph in the book which you endorse by stating that it is "very well put" occurs in the third volume of "Notes on Building Construction," p. 88. The words are practically the same, and I give them in parallel columns on the other side.

FRANCIS E. L. HARRIS.

*** The following are the parallel passages referred to by our correspondent. They certainly bear out what we had already remarked in our article, that the author seemed to have been laying a great many other writers under contribution, without due acknowledgment:—

C. T. Davis' Work.

"A good brick clay is one that contains sufficient fusible elements to bind the mass together, but not so much as to make the bricks adhere to each other or become vitrified.

Such clays contain from 20 to 30 per cent. alumina, and from 50 to 60 per cent. silica, the remainder consisting principally of carbonates of lime and magnesia and oxide of iron."

Col. Seddons' Work.

"A good brick earth should contain sufficient flux to fuse its constituents at a furnace-heat, but not so much as to make the bricks run together and become vitrified.

Such earths contain from ⅓ to ½ alumina, and from ⅛ to ⅓ silica, the remainder consisting of carbonate of lime, carbonate of magnesia, oxide of iron, etc."

BUILDERS' CLERKS' INSTITUTION OF GREAT BRITAIN.

SIR,—I beg to inform you that the meeting of builders' clerks, for the purpose of forming the above Institution, will be held at the Westminster Town Hall, Caxton-street, Westminster, S.W., in Room 13, on Saturday next, November 2, at 5 p.m.

All clerks engaged in the trade are earnestly invited to attend, and bring with them any colleagues they know in the trade not at present knowing of this movement.

A posicard, if convenient, to the undersigned, will greatly oblige, from all those whose intention it is of attending the meeting, and also from those unable to attend, but willing to join after the Institution is once started.

I also wish to inform fellow-clerks in the country and London that prospectuses will be issued shortly after the meeting on Saturday.—Yours faithfully,

J. PEARSE BOWDITCH.

94, Dalberg-road, Brixton, S.W.

WELLS.

SIR,—In excavating near an old building I lately came on a disused well, a section of which I enclose.

The well is sunk in London clay, and although the ground round the well is saturated to a depth of at least 6 ft., the water in the well stood at a level of 41 ft. below the surface, or 20 ft. below the level from which the pumps still existing could have drawn water.

Section of Well referred to in Mr. Cooper's letter. (The dotted line A A represents level to which underground water rises.)

It seems impossible that the water in the well could have evaporated, as the stone covering the well had about a foot of garden mould in a sheltered position over it, and surrounded with ground, as before stated, which was saturated.

C. H. COOPER.
Wimbledon Urban District Council.

A MAGNIFICENT OFFER.

SIR,—At a recent meeting of the Northallerton Urban District Council a resolution was carried that invitations be sent to three or four "competent engineers" asking them to formulate a sewerage scheme suitable for that district, and that the Council should offer a premium of 15*l.* for the scheme which they decided to accept. Surely the District Council made a serious mistake when they resolved to offer the magnificent sum of 15*l.* as a premium, and Mr. Baines forgot himself when he indulged in such an outburst of generosity towards three or four "competent" engineers when he moved that they should be asked to formulate schemes of sewerage for an important place like Northallerton, and that the successful engineer should be paid the sum of 15*l.*, which is about equal to a penny per head of the population, and about one-third of a penny in the pound on the general district rate of the district. Any "competent" engineer who complies with an invitation of the Northallerton Council which expects something for nothing is not worth his salt, and ought to (as he would, no doubt) earn the contempt of the engineering profession. I have yet to learn that a man's services are to be rewarded according to the measure of the poverty of the local authority requiring his services. If I thought that such bounty as that proffered by the Northallerton Urban District Council were to be my reward, I would ask my father to cancel my articles with the "competent" engineer under whom I am serving, and either to hire me out as a crossing-sweeper or to put me as an apprentice to a hawker of sand and rubbing-stones, so that I might have the hope of some day securing a competency, and of eventually retiring to a suburban villa and becoming a famous District Councillor, moved only by one feeling—that of saving the rates and paying every man according to his worth—his worth being assessed by me.

"APPRENTICE," C.E.

October 23, 1895.

PEMBROKE DOCK INTERMEDIATE SCHOOL COMPETITION.

SIR,—Probably it will be of interest to certain of your readers to know how (as I am given to understand) the above competition is being managed; for I find competitors cannot learn much by inquiry of the clerk.

I have written to know what result has been arrived at, but no answer has been sent. From another source I gather that about a month ago a Mr. —— was sent for by the Governors to receive their instructions as to how he should modify his plans, and also reduce the cost to meet their views, as his competition design far and away exceeded the stipulated amount, and that until it was seen how the amended set turns out, nothing would be settled.

I need not ask whether it is fair for this architect to have the opportunity of amending his plans, while the decision is held in abeyance.

"A COMPETITOR."

ST. SAVIOUR'S GRAMMAR SCHOOL.

SIR,—My attention has been called to a paragraph in your issue of the 26th ult., stating that it is the intention of the Governors of the St. Saviour's Grammar School to remove to some convenient spot in the London suburbs. I beg to inform you that up to the present time the Governors have not come to any such conclusion.

HENRY LANGSTON,
St. Saviour's Vestry Offices. *Clerk*

The Student's Column.

METALS USED IN BUILDING.—XVIII.

COPPER ALLOYS (*continued*).

Oriental Bronze.

THE majority of the celebrated art objects from China and Japan, usually known as bronze, are not in reality entitled to that name, though they may be conveniently alluded to now as being at any rate alloys in which copper enters to a very large extent. The Chinese and Japanese have attained great perfection in the manufacture of these alloys, many of which contain large proportions of gold, though this precious metal is not employed to any extent in bronzes for interior house-decoration. The Chinese make bronze ornamental work forged by the hammer, which is very thin and raised up in the middle. Klaproth has shown that these contain nothing but copper and tin, in the proportion of 78 of the former metal to 22 of the latter. This alloy when newly cast is as brittle as glass; but by being plunged at a cherry-red heat into cold water and confined between pieces of iron to keep the casting in shape, it becomes tough and malleable.

The following alloys are typical of the metal used in Japan and China for colossal statues and any large high-class decoration work:—

Chinese and Japanese Bronzes.

	I.	II.	III.	IV.
Copper.....	94·61	95·77	67·31	51·05
Silver	1·55	·08	32·17	48·83
Gold	3·73	4·15	traces	·12
Lead	·11	—	—	—
Iron	—	—	·52	—

Alloys Nos. I. and II. are known as *shakudo*, and are principally characterised by the large percentage of gold; for all practical purposes they may be regarded as modified forms of copper. The gold, however, serves a useful purpose, as the alloy is enabled in consequence to receive a purple patina by the application of pickling solutions. This subject has formed an exhaustive study on the part of Professor Roberts-Austen, who has done so much to increase our knowledge of Oriental bronze. Concerning these pickling solutions, the student may consult the *Journal of the Society of Arts*, October, 1888.

Alloys III. and IV. in the above table are known as *shibu ichi*, of which, however, there are many other recognised standard varieties. The percentage of silver, it will be noted, is very high; the alteration of this ingredient in the air imparts a rich tone to the metal as used for decorative purposes. Professor Austen observes that copper containing a small quantity of antimony gives a very different shade to that resulting from the pickling of pure copper. But the copper produced in Japan is often the result of smelting complex ores; the result is that the so-called antimony of Japanese art metal-workers which is present in the variety of copper known as *kuromi*, is an alloy of tin, cobalt, &c., with copper. Oriental metallurgists often blend metals and alloys of different colours by pouring them together at a temperature near the solidifying point of the more infusible of the metals to be associated, a mottled alloy being thus produced.

Other Oriental bronzes contain from 2 to 6 per cent. of tin with lead up to 20 per cent., and a fair proportion of zinc, weathering to a deep black tint. It does not appear, however, from the researches of French metal-workers, that lead must necessarily be present to lead to the deep black assumed.

Manganese Bronze.— Ferro-manganese has been employed with copper, and for certain purposes this enables inferior grades of the cupriferous metal to be alloyed with zinc, &c. The general effect of manganese is to render the copper tougher and more ductile, and when iron is present to a small extent the tenacity and elasticity of the copper are increased. Such alloys are not easily corroded, but, being used more especially in machinery for ships, are not very important to us.

Bell-metal.—Ordinary bell-metal is an alloy of copper and tin, but in certain cases other metals are added to produce definite tones or to cheapen production. In any case, however, the proportion of other metals is small, except in bells for domestic use, in which a large quantity of antimony (up to 13 per cent.) or bismuth (nearly 4 per cent.) is commonly employed. Quite a large number of cheap bells are only brass, more particularly when raised work has to be produced exteriorly. Large bells are cast with an alloy of 4 parts copper to 1 part tin, which also closely resembles the material used for cymbals and gongs. The metal when first cast is very brittle, but becomes somewhat malleable after being heated to redness and quenched in water. To impart elasticity, which is necessary in order that it may emit a full, clear sound, the bell is again heated and allowed to cool slowly. Apart from inherent qualities of the metal used, the tone of a bell is materially influenced by its size, shape, and thickness.

Gun-Metal.—We are not interested in this metal as applied to the manufacture of ordnance (a purpose, however, for which it has been almost entirely superseded by iron and steel); its sole use for us is in making "anti-friction" bearings for machinery and the like. Gun-metal as understood in the market is an extremely variable substance, composed essentially of copper, but it should possess the requisite degree of hardness and toughness; a good gun-metal is obtained by mixing copper, tin, and zinc. On the whole, this alloy is more fusible than copper, and presents great resistance to strain tending to force its particles asunder. Professor A. K. Huntington remarks * that in consequence of the great difference in the specific gravity of the metals employed it would scarcely be possible to mix them thoroughly if they were simply introduced together into the reverberatory furnace in which the alloy is prepared. It is customary, therefore, to melt the tin first with twice its weight of copper, so as to obtain hard metal, which is then added to the proper proportion of copper melted on the hearth of the reverberatory furnace, care being taken to exclude oxygen as far as possible. The formation of the alloy is facilitated by the addition of old gun-metal. A little more than the necessary proportion of tin is usually added in order to allow for the unavoidable conversion of a portion of that metal into oxide by the oxygen of the air.

TIN ALLOYS.

Pewter.—We should be very sorry to attempt an exact definition of the metals that, generically, go by the name of pewter in the market. On the whole, they may be said to be alloys of tin and lead, with a little antimony or copper, depending on the particular purpose for which the metal is required. For many years English pewterers have distinguished three principal kinds called

* "Metals," 1894, p. 270.

plate, trifle, and ley pewter. The first-mentioned has a bright silvery lustre when polished; and the higher grades of it are composed 100 parts tin, 8 parts antimony, 2 parts bismuth, and 2 parts copper. Trifle pewter is an inferior alloy generally containing a high percentage of lead, but made typically of 83 parts tin and 17 of antimony. Ley-pewter has 4 parts tin to 1 of lead, though more than 20 per cent. lead is often found. Considering the purposes o which pewter is put in the building arts, it is not surprising that the baser metal predominates in nearly all varieties employed in the trades. Indeed, we should, probably, not be far out in stating that the price of metal for the time being exerts considerable influence on the proportions adopted in the majority of instances. Ley-pewter is harder, more tenacious, and fuses more readily than either of the metals used in the alloy separately. Mr. Hiorns gives * a useful hint to enable one to estimate the quantity of lead present in tin-lead alloys. Lead leaves a dark mark when drawn across paper, and when only a limited quantity of tin is alloyed with it this property is still retained, but if a certain limit be exceeded, the alloy is no longer capable of producing the dark mark; hence it is possible to roughly estimate the quantity of lead present, taken in conjunction with the behaviour of the metal under hammer, file, and chisel. Tin 90 parts and lead 10 parts does not streak paper; tin 75 lead 25 gives a very faint mark; and all tin-lead alloys containing less than 75 per cent. of tin will mark paper. It is a pity we are not told the class of paper to be experimented with, as that must be an important factor. The general effect of lead on tin is to increase its malleability and ductility, but to diminish its tenacity and toughness.

The best quality pewter consists chiefly of tin, with only small proportions of lead and copper. Owing to the cheapness of tin at the present time, it is now often used in a comparatively pure state instead of pewter—but not much in the building trades. Tin and lead in equal proportions melt at 372 deg. Fahr., 75 tin and 25 lead at 354 deg. Fahr., 25 tin and 75 lead at 482 deg. Fahr., 10 tin and 90 lead at 538 deg. Fahr., and 6 tin and 94 lead at 557 deg. Fahr.

Babbit's Metal.—A large number of different alloys have been sold under the name of Babbit's metal, but the inventor described it as of 24 lbs. tin, 8 lbs. antimony, and 4 lbs. copper, which he called "hardening," and for every lb. of that mixture he recommended the addition of 2 more lbs. tin. It is used as an "anti-friction" substance for machinery bearings, though it is now largely superseded by other substances.

Terne-plate.—This resembles tin-plate only that, instead of the iron being covered with tin, an alloy of tin and lead is used; it is sent to America for roofing and other purposes.

Solder.—Solders are of various kinds, many of which do not fall within the scope of tin or lead alloys. But the solder commonly known to builders is for the most part an alloy of tin, lead, and bismuth. Ordinary plumbers' solder is composed of about equal proportions of the two metals; coarse solder has two parts lead to one of tin; and fine solder has two of tin and one of lead. Professor Huntington states that in making solder the proportions of the metals can be judged of from the appearance of the alloy. When it contains a little more than one-third of its weight of tin, its surface, on cooling, exhibits circular spots, due to a partial separation of the metals; but these disappear when the alloy contains two-thirds of its weight of tin.

Whilst treating of this subject it may be well to give the following brief particulars concerning solders in general:—

Composition of Solders.

Pewterers' Solder. — (I.) Bismuth 2, lead 4, tin 3; (II.) bismuth 1, lead 1, tin 2.

Soft Spelter Solder. — Equal proportions of copper and zinc.

Coarse Plumbers' Solder.—(I.) Tin 1, lead 3; (II.) tin 2, lead 1. Solder (I.) melts at about 500 deg. Fahr., and (II.) at 360 deg. Fahr.

Spelter Solder.—Zinc 12, copper 16.

Where thin sheets of metals are soldered together as in imitation Japanese metal-work of "wood grain" patterns, the following has been found to answer well: Silver 55·5, zinc 26·0, copper 18·5.

In soldering aluminium bronze, an alloy of half-and-half lead and tin solder with varying proportions (from 12 to 50 per cent) of zinc amalgam has been employed. But a common method is to place the parts to be united in a solution of sulphate of copper and touching them with soft iron. Subsequently the surfaces may be tinned and united by soft solder.

For uniting the edges of iron, copper, or brass, an alloy of brass and zinc is used, and for fine work a little silver is added; this is sometimes called "hard solder." In copper-zinc brass solders the alloy is mixed in such proportions that its fusing-point shall approach as nearly as possible to that of the metal to be united, the melting-point being higher as the proportion of copper is increased. The alloy most commonly employed for soldering ordinary brass is composed of about equal weights of copper and zinc.

In applying solders to parts of the metal to be united, fluxes are generally used, for various reasons. The best known fluxes are borax, sal-ammoniac, chloride of zinc, common resin, Venice turpentine, tallow, and Gallipoli oil.

* "Mixed Metals." 1890, p. 253.

GENERAL BUILDING NEWS.

RESTORATION OF PARISH CHURCH, GLAMORGAN.—The old Parish Church of Merthyr is now being restored at a cost of about 4,000*l.* by Messrs. W. Cowlin & Son, of Bristol, from plans by Mr. J. L. Pearson, R.A.

ADDITIONS TO TRINITY HALL, ABERDEEN.—Trinity Hall Buildings, at the south-east corner of Union Bridge, and belonging to the Seven Incorporated Trades of Aberdeen, have now been extended from Union-street to the ancient thoroughfare known as the Green. Messrs. Brown & Watt, Aberdeen, were the architects, and the cost of the additions and alterations has been 10,000*l.* The entrance from Union-street and the staircase are a feature of the remodelled front building. The lobby is laid with ceramic mosaic work, in which is introduced a representation of the arms of the trades. The steps of the stair are of Sicilian marble, each step weighing about half-a-ton. The sides of the staircase are lined with Pavanazzo marble, with rouge marble mouldings, and the balustrade is of marble of similar quality and texture to the staircase. The copings are of Pavanazzo marble, and the balusters are of rouge marble. At intervals on the coping are vases of green marble. At the top of the staircase and rising from octagonal bases are four columns of white Sicilian polished marble, supporting the cupola above. All round the landing on both sides of the staircase there is a warm-coloured marble dado, while the doors of the rooms have marble architraves. The entire floor of the stair landing is laid in ceramic mosaic work with floral borders. The vestibule ceiling, which is lined with oak, has been divided into eight panels with Gothic mouldings. The cupola, which lights the staircase, is 35 ft. from north to south and 7 ft. wide. In the older portion of the structure is now a ladies' drawing-room, having lavatory accommodation, &c., connected. On the level of the large hall is a supper-room in the new part of the building, 45 ft. by 22 ft., the panelled roof being about 30 ft. above the floor. There are four large stained-glass windows to the south, and there is an oriel window to the west, embellished by the arms of the city and university and the armorial bearings of the different trades. The roof is of polished American pine with polished rib mouldings. Above the oriel window is a musicians' gallery. Above the American pine dado, the walls up to the frieze are hung with embossed anaglypta of a pale green colour, and the frieze on the upper part of the walls is elaborated with the armorial bearings and mottoes of the different guilds or crafts. Adjoining is a committee-room. There are also cloak-room, butlers' pantry, (with lift to kitchen). The former convener's room in the old portion has been converted into a smoking-room, and the old smoke-room into a strong-room, the convener having a new room in the addition. Trinity Hall itself has a new oak floor, the oak dado has been retouched, and the wall above stained a deep, warm, red colour. The frieze is similarly treated to that of the minor hall or supper-room. Two wrought-iron dog-grates are placed on the south side, and the alcoves at each end are diapered and richly gilt. The main (oak) timbers of the open roof have been repainted and the spaces between filled in with stars and pateras. The stained-glass windows have been left untouched, and seventy-two electric lamps have been introduced.

NEW SCHOOLS, ASHTON-UPON-RIBBLE.—The new St. Andrew's School, now being carried out from the designs of Messrs. Myres, Veevers, & Myres, architects, of Preston, is intended for the boys (the girls and infants occupying the whole of the old buildings). The plan of the new building is in the shape of the letter L, and comprises two large rooms capable of being thrown into one for entertainments, concerts, &c., with a cloak-room attached. The school is being built of Haslingden parpoints, lined with brick, and in style to harmonise with the adjoining buildings. The roof will be slated with North County slates, and all internal walls plastered. The schools will be heated by hot-water, and every attention is being given to the ventilation and lighting. The main school will accommodate about 212 boys, and will seat at entertainments over 430. The contractor is Mr. John Christian, the sub-contractors being Messrs. J. N. Livesey, joiner; R. Arrowsmith, plasterer; Croasdale and Son, plumbers; C. Seward, heating; Foster Bros., ironfounders; and Nickson, ventilation. The total amount of the contract is 1,581*l.* The school of St. Michael's and All Angel's, at the same place, is being extensively enlarged under the same architects. The additions comprise a large room on land purchased and presented to the trustees by the late Mr. Wm. Birley. The internal dimension of the building is 77 ft. 6 in. by 24 ft., and 16 ft. high to the ceiling. The roof will be open timbered, carried by six curved and traced principals, supported by moulded stone corbels. The large room will be provided with movable wood and glass partitions to serve as class-rooms. Galleries and the usual school fittings will be provided. The school is being built of brick with stone dressings; the roofs slated and internal walls plastered. The main school will give accommodation for 116 extra scholars, and when used for entertainments, concerts, &c., will seat over 360. Attached are porches, cloak-rooms, and lavatories. The contractor is Mr. Thos. Croft, the sub-contractors being Messrs. G. Hill, joiner; R. Arrowsmith, plasterer; T. H. Kellett, plumber; C. Seward, heating; Foster Bros., iron-founders; and Nickson, ventilation. The total amount of the contract is 1,272*l.*

MORTUARY, BELFAST.—The new mortuary at Belfast, which has been erected by the Corporation to supersede the structure in Victoria-square, is now almost completed. The building is situated at the end of the Sand Quay, near the old Central Railway Bridge across the Lagan, and it stands on ground which was formerly part of the foreshore of the river. The foundations of the building have been entirely piled. The entrance is from the Laganbank-road. The yard is paved with setts on a concrete foundation. The mortuary proper comprises a waiting-room for jurors and an attendance-room, two mortuaries (one for infectious and the other for non-infectious cases), a post-mortem room, and a dead-house, with lavatories for the use of medical men and others engaged. The whole of the buildings are laid with Limmer asphalte floors on cement concrete, and the walls are lined with white glazed tiles. The roofs are slated, and have roof-lights, glazed with Heywood's patent glazing. Water is laid on to each apartment. The heating will be done by gas-stoves. The post-mortem room is fitted with a Jennings' patent revolving dissecting-table. The building was designed by the Borough Surveyor, Mr. J. C. Bretland, and the work has been carried out by the contractors, Messrs. W. J. Campbell & Sons, with Mr. James Moore as clerk of works. The plumbing and gas-fitting were attended to by Mr. Harrison M'Cloy, and the gates were supplied by Messrs. Musgrave & Co., Ltd. Annadale bricks have been used in the building, and the dressings are of Dumfries red sandstone. The enriched terra-cotta panels on the side fronting the road are the work of the Annadale Tile Company.

POLICE-STATION, STOKE-ON-TRENT. — A new Police-station is about to be built at Stoke-on-Trent, and the plans of Messrs. Wood & Hutchings, of Burslem and Tunstall, have been selected in a limited competition by the Staffordshire Standing Joint Committee. The work will be proceeded with at once.

BAPTIST CHURCH, LOWESTOFT.—Mr. George Baines, London, is the architect for a new Baptist Church to be erected in London-rd., Lowestoft. Plans have been adopted which will involve an expenditure of over 3,000*l.*

METHODIST CHURCH, HYSON GREEN, NOTTINGHAMSHIRE.—The foundation-stones were recently laid of a new Methodist church at Hyson Green. The structure, when completed, will consist of a schoolroom, 54 ft. by 32 ft., a large lecture-room, two class-rooms, and the necessary kitchen arrangements on the basement floor—which is sunk 6 ft. below the level of the footpath, and is approached by two flights of staircases. The middle floor will be occupied by a ladies' parlour, another class-room, and a ladies' cloak-room, whilst above, raised 9 ft. from the level of the street, will be the chapel, 54 ft. long by 54 ft. wide, planned in the form of a Greek cross, with the seats radiating. On the same level will be an orchestra, situated behind the rostrum, as well as minister's and choir vestries. The large schoolroom and the chapel are each estimated to accommodate 350 persons. The facings will be of best local red bricks, with Ruabon terra-cotta and Darley Dale stone dressings. Cathedral tinted lead lights will be used for the windows, and varnished pitch-pine for the internal woodwork. Mr. F. W. Dixon, of Manchester, is the architect.

BAPTIST CHURCH, CARDIFF.—The foundation-stone has just been laid of Ainon Chapel, Cardiff. The new chapel, the contract price of which is 2,560*l.*, will accommodate 800 worshippers; Messrs. Habershon & Fawckner being the architects, and Mr. George Haywood the contractor. The building will be mainly of blue local stone, with Bath stone dressings, and a feature of the structure will be octagonal turrets at the junction of the two streets to which the building will have frontages.

JEWISH SYNAGOGUE, PONTYPRIDD.—The Chief Rabbi recently consecrated a new synagogue at Pontypridd. The synagogue is of Gothic style, and is situate immediately above the Taff Vale Railway. On the basement are nine rooms. It is 40 ft. by 30 ft., and provides accommodation for nearly 200,

and has caretaker's room, baptistry, &c. The ark is of pitch-pine. There is also a platform, or reading-desk, in Gothic style, occupying the centre of the synagogue. It has three or four entrances, and above it is a damask canopy. The contractor was Mr. James Snelling, Pontypridd, and the architect Mr. Lloyd.

ADDITION, EXETER HOSPITAL.—An extensive addition, costing upwards of 7,000*l.*, is being made to the Devon and Exeter Hospital, from the designs and under the superintendence of Mr. Cole, of Exeter. The contract has been let to Messrs. Tree & Bolley. The floors are to be fireproof, on the "Mark Fawcett" system.

BURGH CHAMBERS, MILLPORT, BUTE.—These new buildings were recently opened by Provost Allan. The buildings, attached to the Town Hall, consist of a lesser hall, kitchen, smoking-room, committee-rooms, ladies' and gentlemen's cloak-rooms, lavatories, and Commissioners' chambers, to be reserved exclusively for Council meetings. The architect was Mr. Barclay.

RESTORATION OF ST. ANDREW'S CHURCH, NORMANBY, YORKSHIRE. — The Archbishop of York, on the 26th ult., reopened the ancient church of St. Andrew, Normanby, near Kirbymoorside, restored under the supervision of Mr. Temple Moore, architect, of London. The church had suffered much from the ravages of time, and prior to the restoration presented a somewhat dilapidated appearance. The north aisle had gone, the arcade being filled up. Most of the windows had been modernised. The chancel had been considerably shortened, presumably in the last century. Included in the present restoration were the rebuilding of the north wall, restoring the north aisle, and opening out the thirteenth-century arcade. The chancel arch was rebuilt, and a new east window inserted, the work of Mr. Victor Milner, of London. It is of three lights. A new west window, of three lights, has also been inserted, given by the Earl of Feversham. Other work includes the rebuilding of the porch, restoration of south door, refacing of west wall, re-building of bell-tower, and the bells recast by Messrs. Mellanby, of Masham. The roof of the church is entirely new. The nave is covered with modern tiles, but the old stone slabs were used for the chancel-roof, the ceiling of which is divided into panels, &c. The old box-pews have been dispensed with, and open seats of pitch-pine substituted. The chancel-seats, reading-desk, and pulpit are of oak. The remains of a Norman piscina, which were found in rebuilding the chancel-arch, have been built into the south wall of the chancel. Several old fragments of tombs, on which appear the cross of St. Cuthbert, have also been built into the walls and flooring. A new stone font, given by the Misses Hill, takes the place of a quaint wooden one, which has been placed near the south door, and "converted into an alms-box."

BOARD SCHOOLS, SALFORD.—On the 26th ult. the memorial stones were laid of two new schools—one in Blackfriars-street and one in Marlborough-road, Salford. The site of the building in Blackfriars-street contains 3,015 square yards. The school will accommodate 666 children, 290 being infants and 376 older children. The school is being built by Messrs. W. Southern & Sons, from designs prepared by Mr. Henry Lord. The tender for the building amounted to 7,268*l.* The school is arranged transversely to the length of the site, and stretches from East Stanley-street to Wheathill-street, with its main frontage to Blackfriars-street. The Marlborough-road school will accommodate 926 children—namely, 450 girls and 476 infants. The school is the first which the Board has built on the central hall system. Each of the two departments will have a central hall 60 ft. by 30 ft., and class-rooms will be ranged on three sides of the central hall. The site contains about 5,300 square yards (measuring into half the adjoining streets). The building is being erected by Messrs. R. Neill & Sons, from the designs of the architects, Messrs. Woodhouse & Willoughby. The accepted tender amounted to 7,777*l.*

CONSERVATIVE CLUB, NEW SEAHAM, DURHAM. —On the 26th ult., a new Conservative Club was opened at New Seaham. The new institution faces the main road, and is built of brick, with stone-facings. On the right of the entrance is the billiard-room. On the opposite side of the entrance are two apartments — the reading-room and smoke-room respectively, which can be thrown into one. There are also a committee-room, bar, caretaker's-rooms, and other apartments. The building has been erected from the designs of Mr. Robert Currie, New Seaham.

CO-OPERATIVE PREMISES, NEWCASTLE.—The new premises which have been erected by the Newcastle Branch of the Co-operative Printing Society, Limited, at the corner of Rutherford-street and Bath-lane, have just been opened by Mr. John Shotton. The building has been erected from designs prepared by Mr. F. Rich, architect, of Newcastle. It occupies a site containing 800 square yards, nearly the whole of which is occupied by buildings. The building is six stories high, and is constructed with brick, with stone dressings. The building is lined throughout with cream-coloured glazed bricks. The floors of the building are constructed of cement, concrete, and steel girders, and finished with wooden blocks. The various rooms and shops throughout are warmed by a system of low-pressure hot-water piping. Ample cellarage and paper stores are provided in the basement, where also the engine driving the whole of the machinery stands. On the ground floor the sale shop is situated, together with a large paper store. The entrance to the workshops is by a separate staircase. The timekeeper's office is contrived at the foot of the staircase leading to the workshops. The cart entrance and loading dock are planned in connexion with the paper store. The first floor is occupied by the printers, who have a shop 48 ft. by 46 ft., and here also are the board-room and offices, each having a separate entrance. The second floor forms a bookbinding shop 64 ft. by 48 ft., and the third floor a composing shop 64 ft. by 50 ft. A lift connects the whole of these floors from the basement to the third floor. A paper-shoot is also contrived. A dining-room about 24 ft. square, is situated over part of the compositors' shop, and shows on the exterior, at the corner of the site, a dome, which rises to the height of about 100 ft. above the pavement. The building is lighted throughout with electricity. The contractors for the building were:—Masonry and joiner work, Messrs. J. & W. Lowry; slating, Messrs. Hewitson; plumbing and heating, Messrs. Walker & Son; cement flooring, Messrs. W. B. Wilkinson & Co.; painting, Mr. G. G. Laidler; electric lighting, Messrs. W. H. Holmes & Co., all of Newcastle.

"THE KNAPP," BRADPOLE, DORSET. — The work in connexion with the erection of this residence, which crowns the hill near the church, and occupies the site of the old "Knapp Inn," has just been completed. Mr. Johnson, of London, was the architect; Messrs. T. Stone and R. B. Williams being the contractors. Mr. Harry Hems, of Exeter, carved one of the oak mantel-pieces at "The Knapp."

WELSH PRESBYTERIAN CHAPEL, LIVERPOOL.—The Welsh Presbyterian Chapel, Prince's-road, Liverpool, is now ready for reopening. The interior of the chapel and organ-case and pipes have been cleaned and decorated. Pitch-pine ornamental glazed vestibules and screens have been constructed at entrances of the chapel. The chapel and vestries are lighted by electric-light, supplied and fitted by the Electric Supply Company, of Liverpool. In addition, the mission-hall and library have been enlarged and carried one story higher, provision being made for two class-rooms, with lavatories, cloak-rooms, stores, and offices. A minister's vestry with outer walls faced with Yorkshire stone shoddies and Stourton stone dressings, has been built. The lecture-halls and schoolrooms have been ventilated by Messrs. Whitehead, ventilating engineers, Liverpool. The total cost is nearly 2,000*l.* Mr. John Evans, Liverpool, executed the screens; Messrs. Jelly & Co., Liverpool, were the decorators; Messrs. Haugh & Pilling, Liverpool, were the contractors. The whole of the work has been carried out from plans and specification prepared by and under the supervision of Mr. T. G. Williams, architect, Liverpool.

CHOIR VESTRY, IDLE CHURCH, YORKSHIRE.—The memorial-stones have just been laid of the new choir vestry for the Idle Parish Church. The architects for the new vestry are Messrs. Kendall & Bakes, and the contractor is Mr. Coates Murgatroyd, of Idle.

MASONIC HALLS, GLASGOW.—On the 26th ult. the foundation-stone of the Glasgow Masonic Halls was laid by the Provincial Grand Master. The building is situated at 98 and 100, West Regent-street. The part fronting the street will be five stories in height, and will be let for commercial purposes. At the rear will be a large Masonic Hall, measuring 65 ft. by 40 ft., and capable of seating about 450 persons. Adjoining will be two lodge-rooms, with the necessary accessories, for the meetings of lodges. The buildings will cost about 16,000*l.* Mr. J. L. Cowan, I.A., is the architect.

RENOVATION OF ST. JOHN'S, REDLAND, BRISTOL.—This church has just been re-opened, after having been closed since July for the carrying out of a scheme of renovation and repair. A new pulpit has been added as a gift of one of the members of the congregation. This is constructed of Caen stone, the panels being divided by Devonshire marble. Alterations have also been made to the choir-stalls, the roof repaired, and the bell re-hung. A new reredos is now in course of construction. The pulpit is from a design by Mr. H. V. Gough, the architect, who has also undertaken the general supervision of the renovations.

HIGHER GRADE SCHOOL, GRIMSBY.—The Wintringham Higher Grade School, at Grimsby, which has just been built and furnished at a cost of 11,808*l.*, was opened on the 24th ult. The school is situated in Eleanor-street, and has been freely treated in the Flemish Renaissance style; the foundation is of granite, and the main roof is surmounted by a turret. Accommodation is provided for a thousand pupils, and in addition to the various class-rooms, lecture-theatre, &c., there is a swimming-bath and gymnasium, a manual instruction-room for iron and brass work, fitted up with lathes worked by power, and a chemical laboratory. A dining-room is also provided for the use of pupils coming from a distance. For the girls, there is a large laundry and ironing-room, with drying-closets and other accessories. The work has been carried out from the designs and under the superintendence of Mr. H. C. Scaping, the Board's architect. Messrs. Hewins & Goodhand, of Grimsby, were the contractors for the building. The heating apparatus is by Messrs. King & Co., of Hull; bath-heating arrangements and piping, Messrs. G. N. Haden & Son, of Manchester; and plumbing, Mr. J. Duke, of Grimsby.

RESTORATION OF THE PARISH CHURCH, LLANTHONY.—The Parish Church of Llanthony has been under restoration since 1893. It consists of nave, 52 ft. by 19 ft.; chancel, 34 ft. by 15 ft.; and north porch. It is situated 779 ft. above the level of the sea, six miles from Llanvihangel Crucorney Station, Great Western Railway. The nave roof consists of eight pairs of principal rafters, carrying two purlins on each side, supporting fifty-six common rafters and double ridge pieces. This roof has been stripped, the timbers thoroughly restored, then strengthened with iron plates, straps, and bolts, and covered with boarding, felt, and the old stone tiles relaid. The floor of the nave has been lowered so as to get a step at the chancel arch, but it is still 18 in. above the original floor line which was found, but could not be kept. A bed of concrete has been laid over the whole area of the nave, or what was originally the Abbey infirmary. The modern seats, pulpit, and ancient font have been re-fixed. The internal plaster has been retained, as it is quite in keeping with the old stone walls. A small new window has been inserted in the north wall to give light to the pulpit. All the windows have been re-glazed by Messrs Joseph Bell & Sons, Bristol. A new oak door for the north entrance has been provided. The hinges, hooks, latch, ring-handle, and straps are the work of Mr. James Howells, the village smith. The church is heated by one of Musgrave's latest improved underground stoves. The porch has been rebuilt with the exception of the east wall. The timber used in the restoration was supplied by Messrs. Alexander & Co., Cardiff, and Messrs. Batchelor & Co., Newport. The first portion of the work was finished by Mr. Pritchard, of Llanthony. The second contract was completed by Messrs. Denman & Sier, Abergavenny. During the excavation of nave and porch floors several pieces of pottery and glass were found, most of them about three hundred years old. The work has been carried out from the plans and under the superintendence of Mr. J. James Spencer, architect, Abergavenny.

NEW CATHOLIC CHURCH, CHELSEA. — On the 23rd ult. the opening of the Church of Our Most Holy Redeemer, Cheyne-row, Chelsea, took place. The church, which was designed by Mr. Edward Goldie, is Italian in style, of an English type. It is 115 ft. long by 34 ft. in width across the nave, and has a height of 42 ft. An illustration of the building appeared in our issue of the 12th ult.

SANITARY AND ENGINEERING NEWS.

THE POLLUTION OF THE AIRE AND CALDER.—On the 20th ult. the Elland Urban District Council instructed Mr. Malcolm Paterson, M.Inst.C.E., of Bradford, to prepare detailed plans, specifications, and quantities of the works for the main outfall works and sewage treatment of the district, recently sanctioned by the Local Government Board. The circumstances connected with this sanction are worthy of note as bearing upon the powers of districts, and the pollution of rivers. The scheme embraces the reception of trade-refuse into the sewers. The volume of this, in proportion to the domestic sewage, is very large, and the Local Government Board recommended the reconsideration of this part of the scheme. For eighteen months they held back their sanction on this ground only, no alteration whatever being suggested in the works proposed. The Council, however, did not move from what they deemed the fair policy to their manufacturers, considering that the responsibility for this refuse, accepted as it was by the other woollen districts around, and indeed in some measure imposed upon them by the Rivers Pollution Act of 1876, belonged to them, and should not be refused. To do so, they thought, would be to handicap their own largest ratepayers—who would have to make and maintain the works—in favour of their rivals. A further complication existed in the fact that, for a generation or more, trade refuse of the same character—woollen dyeing and scouring water—has been largely received into the sewers of Elland, and in the knowledge that capital has been largely invested on the security of the relief thus afforded. The assent of the Local Government Board was accompanied by a statement that the Council, and not they, must take the responsibility of securing that no breach of the Rivers Pollution Act shall occur. The amount of the loan sanctioned is 13,500*l.*

WAKEFIELD WATER AND SEWERAGE WORKS.—A meeting of the Wakefield City Council was held on the 22nd ult., when a recommendation from the Waterworks Committee was discussed, that a duplicate length of mains should be laid from Ardsley to Wakefield, 18 in. in size, from Ardsley to Lindle Hill, and 24 in. between Lindle Hill and the city boundary at New Scarborough; and also that instructions should be given to Mr. H. Rofe, the engineer, to proceed with the preparation of plans, specifications, and estimates, for the construction of the Booth, Dean, and Oxygrains reservoirs. The Council also considered a recommendation from the

Sewerage Committee that the amount applied for in respect to the proposed sewerage works at Calder Vale should be increased from 78,000*l.* to 82,000*l.*, so as to enable the Council to comply with certain requirements made by the Local Government Board. Ald. Booth (Chairman) moved the adoption of the Waterworks Committee's recommendations. Councillor Bolton formally seconded the motion, which was ultimately agreed to. The tender of Messrs. Cochrane, Grove, & Co., Limited, for the supply of cast-iron pipes, &c., was accepted; and that of Messrs. Holme & King, of Liverpool, for laying and fixing the mains.

THE PURIFICATION OF THE AVON.—Bath Urban Sanitary Authority received on the 29th ult. a report upon a scheme for disposing of the city sewage, which is now discharged into the River Avon. It is proposed to conduct the sewage from various parts of the city by means of intercepting sewers, varying in size from 9 in. to 36 in., with high and low level systems, to a site at East Twerton, and about 200 yards outside the city. The intercepting sewers will be laid principally on the banks of the river, and for some distance will be carried along piles at the water's edge, passing under the Avon at three points. Having been received in a large tank, the sewage will be chemically treated, and carried into precipitation tanks; the effluent will pass over coke filter-beds, and filtration beds of sand, polarite, &c., and will then be sent through a 24-in. main some two-and-a-half miles, to a site of forty acres between the villages of Newton St. Loe and Kelston for land filtration. At the works at Twerton the sludge will be pressed dry, and the solid cakes can then be used for manurial purposes, or burnt in the destructor situated on the opposite bank of the river, which now consumes the refuse of the city. The cost of engineering works only is estimated to be 49,300*l.* for sewerage, and 43,786*l.* for sewerage disposal, but to this has to be added the purchase of land, compensation, legal expenses, and incidentals. After a long statement from the chairman of the committee, and considerable discussion, the Council decided to adjourn the whole matter until the next meeting, including a bill from Mr. Radford for professional services to the present time.

RICHMOND SEWAGE WORKS. — On Tuesday afternoon the extensions recently constructed at the works of the Richmond Main Sewerage Board, Mortlake, were publicly opened by the Chairman, Mr. Charles Burt, in the presence of a large company, including representatives from the adjoining districts, engineers, surveyors, and others, the company being afterwards entertained at luncheon in the Board-room by Messrs. James Simpson & Co., contractors to the new pumping-machinery. The works consist of two new pumping-engines, a vertical Worthington, with a capacity equal to twelve million gallons per day, and a centrifugal equal to five million gallons, a Schwoerer superheater fitted on one of the Galloway boilers, new sludge presses, air-compressor, rams, new outfall to the river, capable of passing above thirty-three million gallons per day at high water, and screening-well, &c. The pumping plant and the new sludge-presses contain many points of great interest to engineers, and the whole has been put in with all the most recent improvements to facilitate working and economise abour. The whole have been carried out under the supervision and to the designs of the Board's Engineer, Mr. William Fairley. The contractors were:—For pumping machinery, Messrs. James Simpson & Co., Pimlico; for sludge presses, air compressor, &c., Messrs. S. H. Johnson & Co., Stratford; for outfall to river, &c., Mr. W. Cunliffe, Kingston; and for tiling work, &c., inside engine-house, Mr. G. W. Heasler, Richmond.

THE EXTENSION OF THE ELECTRIC LIGHT IN HANLEY.—Mr. G. W. Willcocks, M.Inst.C.E., a Local Government Board Inspector, held an inquiry at the Town Hall, Hanley, on the 16th ult., for the purpose of investigating an application by the Hanley Town Council for permission to borrow the sum of 20,000*l.* for the purpose of extending the electric-light works and mains. The Town Council was represented, amongst others, by Messrs. A. Challinor (Town Clerk), J. Lobley, M.Inst.C.E. (Borough Engineer and Surveyor), C. A. Cowell and C. J. Sutherland (electrical engineers and joint managers of electricity works). The inquiry was opened by the Town Clerk, who stated that the population of the borough was estimated at 56,000, and that the assessable value was 182,238*l.*, with an outstanding debt of 195,460*l.* The present application was not opposed. It was made under the Electric Lighting Act, 1887, Section 8, and the purpose of the proposed loan was to extend the buildings, boiler-plant, and switchboard required for the new alternator, and to extend the mains in different parts of the town. So far the Corporation had limited the supply of energy to consumers within the compulsory area. The demand for light was increasing continually, and was so great that although the markets were wired and fitted up it was not considered safe to connect them with the mains until further generating plant was provided. The result of the first six months' working ending December 31 last was that 31*l.* was realised over the working expenses, and interest, and sinking fund. The Borough Engineer and Surveyor and the Corporation Electrical Engineer presented a report, which was unanimously approved at a council held on April 30 last, and of which the following is a summary:—No. 1. Extension of mains to Market, Bath, Hope, Clough, Charles, Trinity, Stafford, Tontine, Jasper, Bethesda, and Broad streets; Etruria, Regent, Stoke, Victoria, Avenue, and Park-roads; Piccadilly, Pall Mall, Birch-terrace, Snow Hill, and Park-avenue. These include high and low pressure mains, and for a second circuit of thirty arc lamps. The estimate for the above cables, including laying, is 5,508*l.* No. 2. Extension of the buildings at the generating station (leaving room for an additional boiler, condenser, and steam alternator, when the same are required). Two new boilers and appurtenances, 16 sub-stations, 20 transformers, 25 junction-boxes, and 30 arc lamps and posts. The estimate for No. 2 list is 5,900*l.* No. 3. Two Ferranti Rectifiers for both the present circuit of thirty arc lamps and for the new circuit; the present arc dynamos and engines being retained as reserve. Also thirty incandescent street-lamps complete on new roads round the park, and sixty incandescent street-lamps in other parts of the town where mains are being laid. Extension of switch-board, and excavations and railings at works. The estimate for No. 3 list is 1,242*l.* No. 4. In consequence of the demand for energy within the compulsory area, considerable extensions have been made to the machinery, mains, sub-stations, and transformers, amounting to 2,650*l.*, and to the buildings, furniture, excavation, drainage, and formation of ground, amounting to 2,000*l.*, sundries, 200*l.*—total for No. 4, 4,850*l.* No. 5: Provision for contingencies, 1,000*l.*, special regard being made for mains to supply manufacturers with motive-power. No. 6: Meters, &c.; estimate, 1,500*l.*, including 250*l.* already expended. Total for present application, 20,000*l.* Mr. Lobley gave a detailed explanation of the purposes for which the money was needed, and Messrs. Cowell and Sutherland showed the increase in the number of lamps connected, which was now considerably above the present capacity of the generating plant, namely, 10,000 8-c.p. lamps. The inquiry then terminated, and the Inspector subsequently visited the works and proposed new lines of mains and sites for arc-lamps.

THE NEWCASTLE WATER COMPANY'S NEW WORKS.—The report of the Newcastle City Engineer, relative to the new works of the water company, has been printed and sent to members of the Newcastle Corporation. In company with Mr. Charles Hawksley, water company's engineer, Mr. Laws visited the whole of the works—from Ramshope, near where the Catcleugh Reservoir begins, to Woodford Bridge, where the Rede water is delivered into the old aqueduct leading from Little Swinburn to Hallington. Commencing at Ramshope, near the head of the proposed reservoir, the work now in progress is that of exploring the site by cutting trenches across the bottom through the loose river drift and down to the watertight strata so as to prove their continuity. There are five or six of these trenches now open. On the site of the proposed dam at Catcleugh the same operation of proving the depth of the watertight stratum below the surface, and its thickness, is being carried on, but in rather a different manner, namely, by the sinking of trial pits on the line of the puddle trench down to, and in most cases for some distance through, the watertight shales. The deepest of these pits is about 102 ft. from present surface, and some of them extend to about 40 ft. below the level of the river-bed. There are eleven pits at present sunk, or being sunk, and the work is being carried on night and day. About 300 men are at work in all, and preparations for a much larger number in the way of huts, &c., is being steadily made, so that as soon as the exploration is so far complete that the exact position of the puddle-trench can be fixed, there need be no delay in pushing the execution of the work with all safe speed. A short distance above the site of the reservoir dam, and so far as to be clear of the present work, a small timber dam about 3 ft. or 4 ft. in depth has been constructed across the river bed. In this dam are formed two submerged openings or slot gauges about 21 in. below the top. These openings are of such a size that when submerged 1 ft. they will pass, if both be open, 4½ million gallons per day, and if the smaller one only is opened, two million gallons. These are the respective amounts of compensation water to be delivered to the river at the different seasons, namely, two millions for the nine months from May to January, and 4½ millions in February, March, and April. Above the dam a temporary intake and recorder-house is constructed with a grid next the river and wire-gauze strainers to strain off floating matters, and a weir, of which the crest or upper surface is just 1 ft. above the level of the submerged gauges in the river dam above described. The effect of this arrangement is that so long as the water in the river is less than the compensation water required by Act of Parliament to be discharged during the season it all passes through the gauge openings in the river dam; and so long as its level never rises more than 1 ft. above these compensation gauges, no water can get over the intake weir into the pipe-main. The permanent 30-in. pipe is now laid from Catcleugh to Brig, a distance of thirteen miles, and from Brig down to Woodford Bridge, thirteen miles also, or twenty-six miles in all. At Brig it is intended to construct a break-pressure tank, or rather reservoir. This will be almost exactly central between Catcleugh and Woodford Bridge; and it is also on the hydraulic gradient. The point of intake at Catcleugh outside the reservoir will be about 730 ft. above ordnance datum, the point of delivery to the old aqueduct at Woodford Bridge is 530 ft. above the same datum, and the Brig break pressure tank will be at 630 ft. The total fall of 200 ft. is thus divided into two parts of 100 ft. on each 13 miles of pipe, making the head on each section the same, and, therefore, the delivery practically equal. The proposed water level in the Catcleugh Reservoir, when full, is 810 ft. above Ordnance datum, but as the intake pipe does not enter the dam but takes its water from a gauge tank outside which is open, there will be no variation in the head of water on the main from any change in the water level in the reservoir as it is more or less full. From Brig downwards there is nothing to remark on until Woodford Bridge is reached, where the water from the Rede is delivered into the Swinburn and Hallington aqueduct at a point about half a mile below Little Swinburn Reservoir. Here a gauge house is being erected with measuring weir and recording apparatus, similar to, and as complete as, those at the Whittle Dene filters.

WATER-SUPPLY, JOHNSTONE, RENFREWSHIRE.—The water has recently been turned on to the new water-filters in connexion with the Johnstone water-supply. The work was started over a year ago by the formation of two filtering-beds, measuring 80 ft. by 60 ft. and 6 ft. deep. There has also been formed a clear water-tank 80 ft. by 40 ft., and the depth of which is 14 ft. All this work was executed by Mr. Urquhart, Glasgow, and it is understood the cost will be about 5,000*l.* The work has been executed near to Craigenfeoch, at the base of Gleniffer Braes. The Water Commissioners have also completed an additional main from Skiff Wood to Bowfield, which is to increase the discharge of water from Rowbank to Stanley Reservoir, belonging to the Corporation. The latter work was entrusted to Mr. R. B. Stewart, of Beith, and it is also expected to cost about 5,000*l.*

FOREIGN AND COLONIAL.

FRANCE.—The new Hôtel de Ville at Saint-Juste-en-Chaussée was opened last Sunday.——To-morrow (Sunday) the monument to President Carnot at St. Chamon is to be opened. It is situated in the public gardens.——The architects and archæologists of the Department du Nord who have protested against the demolition of the Porte Notre Dame at Cambrai, have learned with satisfaction that the Government have determined to class this curiosity of Flemish architecture among the "Monuments Historiques." In virtue of that decision the monument will be restored at the expense of the Department of Fine Arts, with the financial participation of the town of Cambrai.*——There is talk of a railway from Havre to Honfleur. The railway would cross the Seine below the canal of Tancarville and be continued along the bank to Honfleur. The passage of the Seine it is proposed to effect by a moving bridge which would transport the trains from one side to the other. There is also a proposal on foot for a railway from Aix-les-Thermes to Bourg-Madame.——A new Hôtel de Ville at Enghien-les-Bains is to be opened on Sunday.——M. Ollivier, the architect, has been commissioned to construct a theatre at Saïgon, with the assistance of M. Dolival in the sculptural decoration. All the painted decoration will be executed at Paris.

GERMANY.—The *Centralblatt der Bauverwaltung* publishes some interesting details about the progress made with the new Berlin Cathedral. The scaffold is now up, its erection requiring the employment of 110 carpenters. There are fourteen cranes on the works. One million seven hundred and seventy thousand bricks have already been delivered on the site. About 350 cubic mètres of granite and 700 cubic mètres of freestone were put up between March 15 and July 1, and 6,000 cubic mètres of brickwork laid.—— The German press and our London contemporaries, including the *Times*, went to some trouble in giving obituary notices to Herr Jordan, the custodian of the Berlin National Gallery. Herr Jordan, we are pleased to say, enjoys good health, but after reading the notices, many of which were far from complimentary, he considered it advisable to tender his resignation to the German Government. Herr Jordan held office since 1874, and was previously custodian of the Leipzig galleries.——A new circus has been opened at Berlin. It holds an audience of 5,000.——The repairs of the Exhibition buildings have now been taken in hand for next year's Salon. They will cost 12,500*l.*, of which sum the Prussian Government has voted 7,500*l.*——The Committee of next year's great National Exhibition at Berlin has decided to keep the galleries open every evening so as to enable the working-classes to benefit from the collections.——

* The archæologists of the Department du Nord, we fear, have been premature in their rejoicing. It is but too likely that the Department of Fine Arts will destroy the gateway as effectually by their "restoration," as it could be done by demolition.

A highly-interesting collection of modern paintings has been opened at Gurlitt's exhibition rooms at Berlin. There are several works by Lembach, Menzl, and Leibl.——The Richard Wagner Museum has now been given a new home at Eisenach.——A very important Act has been published in the official *Gazette* which will greatly influence the housing of the workmen and minor officials in the employ of the Government. The sum of 250,000*l.* is put at the disposal of the authorities for the erection of sanitary artisans' dwellings, which will be let at a moderate rental. It is expected that the rents will cover the annual expenditure for upholding the new property and its administration, and perhaps even leave a surplus after a moderate interest has been paid on the capital. The surplus, if any, will be used to form a benefit fund for the tenants.——The competition for the monument to the deceased painter Richter at Dresden has been decided in favour of Herr Kircheisen, of Brunswick (premium, 100*l.*, and the commission). There were thirty-three designs.——Extensive alterations and some additions will be taken in hand at the old Government hospital, known as the "Charitée."——A special exhibition of technical books and journals has been held at Munich. Our two official architectural contemporaries, *Zeitschrift fuer Bauwesen* and *Centralblatt der Bauverwaltung*, received distinctions.

AUSTRIA.—Some extensive school buildings have been opened at Vienna for the military cadets. The blocks have cost over 100,000*l.*, and include a fine riding-school with stabling for sixty-five horses.——An exhibition of work from the Arts and Crafts Schools has been opened at the Austrian Museum at Vienna.——Several new schemes for supplying Vienna with drinking-water have been put before the Municipal Authorities, but no decision has yet been arrived at.——The new Tuerkenschanz Tunnel, which is one of the principal works in connexion with the new metropolitan railway at Vienna, has now been cut. Its length is about 850 yards.——A large iron church has been completed at Vienna for the Bulgarian Colony at Constantinople. M. Aznarour, of Constantinople, is the architect, Professor Neumann, of Vienna, acted as consulting engineer, and Herr Halitschek, of Vienna, acted as consulting architect.——An extensive hospital for consumption is to be erected at Alland. The first block, with 108 beds, which will cost about 20,000*l.*, has been commenced.——The buildings for the "Millennium" Exhibition at Budapest are being run up with great rapidity, and the works on the new underground railway are also making progress. The exhibition grounds practically comprise the whole of the City Park, and there will be altogether over one hundred buildings on the ground. The principal blocks are destined for the historical collections, and show respectively the Romanesque, Gothic, and Renaissance styles. M. Alpar is the architect.——Linz is to have electric tramways. This will be a great convenience for tourists descending the Danube by steamer, as the railway station is a considerable distance from the river.——At Bruenn an interesting exhibition of tombstones has been opened. The exhibits are partly in form of designs and models, but there are also a number of full-size monuments.——The new theatre at Agram, which has been opened by the Emperor of Austria, holds an audience of 1,100. Messrs. Fellner & Hellmer, of Vienna, are the architects, and have been much complimented by the Emperor for the successful designs of this building and several others in the Austrian provincial towns.——The proprietors of the great Vienna brickfields propose erecting sanitary dwellings for their workmen. This means housing 8,000 souls.——The Imperial Lunatic Asylum at Vienna is to be closed, and some extensive blocks will be erected on modern principles in the country.——At Laibach, where a new theatre of some architectural pretension has lately been opened, some extensive hospital buildings have also recently been completed.

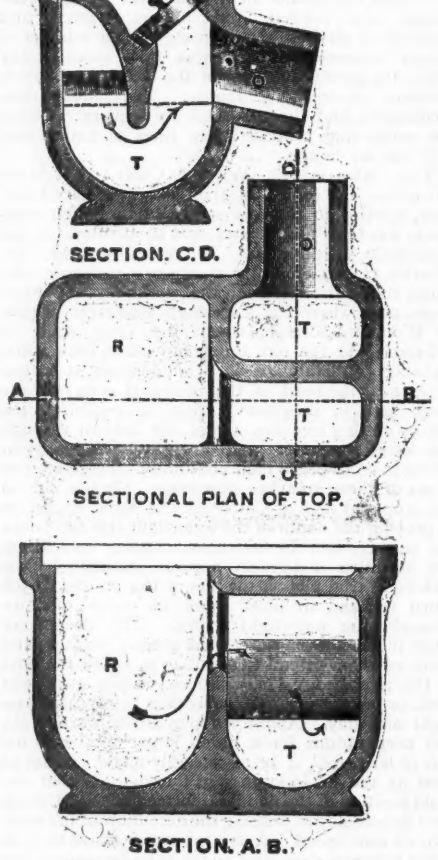
MISCELLANEOUS.

FORM OF CONTRACT FOR NEW BOARD SCHOOLS IN LONDON.—At the meeting of the London School Board on Thursday last week, the Works Committee submitted the report, which we printed in our issue of the 19th ult., p. 282, proposing certain alterations in the terms of all new contracts. Mr. Gautrey moved an amendment to refer the report back to the committee. He wished the report to go back, in order that the representatives of the workmen might be consulted. The Rev. J. Carlile seconded the amendment. Mr. Huggett consented to take the report back.

SWISS EXHIBITION AT GENEVA.—A great National Swiss Exhibition will be opened in the ancient city of Geneva on May 1 next. Extensive works are now in progress on the Plain Palais; huge blocks of buildings are being erected in the suburbs of the city to provide accommodation for the many tourists who will flock to the centre of "the playground of Europe." Artisans and others are advised not to seek employment there, as the labour market is well supplied. Students and landed proprietors will find much to interest them in the numerous examples of Swiss architecture, which are to form special features of the exhibition.

"MUSEUM SUNDAY."—To-morrow, November 3, there will be various special exhibitions, &c., open under the auspices of the Sunday Society, for those who apply for tickets to the Secretaries of the Society, Mr. Mark H. Judge (Hon. Secretary) or Mr. Herbert Freeman (Assistant Secretary), at 26, Regent-street. The following are the places which the owners or managers have agreed to open to holders of Sunday Society tickets:—The Dulwich Gallery (2 to 4); the Flaxman Gallery, University College (2 to 4); the Botanic Gardens, Regent's Park (2 to 5); the Grafton Gallery (3 to 5); Apsley House (3 to 5); the Lady Brassey Museum (3 to 5); Sir E. Burne-Jones's Studio, Lisgar-terrace, West Kensington (3 to 5); Mr. G. F. Watts's Studio, Melbury-road, West Kensington (3 to 5); Mr. Holman Hunt's Studio, Draycott Lodge, Fulham (3 to 5); and the Institute of Oil Colours Exhibition, Piccadilly Galleries (7 to 10). These are open for this occasion by special arrangement, in addition to the considerable list of Municipal Institutions, Libraries, &c., which are open during a part of Sunday afternoon or evening. Sermons are to be preached in a good many London churches in favour of the movement.

THE "GROSVENOR" PATENT GULLY.—The illustrations show the plan and two sections of this gully, designed by Messrs. Bowes-Scott & Western, for receiving surface water, lavatory and bath wastes, yard and stable drainage, &c., from large institutions, such as barracks, factories, hospitals, &c. It consists of a large receiver so arranged as to enable it to be cleaned out without unsealing or in any way affecting the trap; and the trap, as will be seen, is permanently sheltered, and therefore not so



The "Grosvenor" Patent Gully.

readily evaporated should the supply of water to gully fail. A cleaning eye is provided on the outlet which allows of drain rods being inserted, so that any obstruction between gully and drain can be cleared away, should such occur. The gully appears to be a very good and effective one. When the end marked A on the plan is required to be fixed against a building, the outlet may be either right or left-handed. The one shown is a left-hand gully.

MEMORIAL CROSS, EAST BRENT, SOMERSETSHIRE.—The base of the memorial cross in East Brent Churchyard has just been completed. The steps which form the base have been raised about 6 in., and the foundation of the same was found to be so firm and secure that the architect and contractor deemed it unnecessary to build a new one. On the 15th ult. a wooden model of the cross was placed in position by Mr. Hems, of Exeter, the sculptor, for the approval of the committee. The committee who were present expressed themselves satisfied with the design, and the work is now in hand.

MEMORIAL BUST, BUXTON, DERBYSHIRE.—By way of perpetuating the memory of the late Duke of Devonshire, it was some months ago decided that a bust should be placed in the Pump-room. From among a number of competitors Mr. Keyworth, of London, was selected to execute the work, which has been done in Sicilian marble. The bust rests on a marble bracket on the north side of the new Pump-room.

AN ANCIENT ROMAN GALLERY.—According to the *Pall Mall Gazette*, efforts are being made at Albano, near Rome, for recovering the remains of the pleasure-gallery of Tiberius, which is sunk in the waters of Lake Nemi, and from which, it is stated, a number of bronze articles of different kinds have already been recovered.

MEMORIAL BUST, MONTROSE.—A bust to the memory of Dr. Robert Brown, the botanist, was unveiled at Montrose recently. The bust is in bronze, the work of Mr. D. W. Stevenson, R.S.A. It is placed in a niche in the front of the house in the High-street, Montrose, where the botanist was born. The edifice will probably be removed ere long, to make way for a new Town Hall, and in that event a permanent niche will be provided for the bust in the façade of that edifice.

ELECTRIC LIGHTING, NEWPORT.—The public inauguration of an electric light supply has recently taken place at Newport, Mon. The consulting engineer has been Mr. R. Hammond, who was assisted by the Borough Engineer, Mr. K. H. Haynes, in superintending the work.

CHANGE OF ADDRESS.—The Stanton Ironworks Company have given up their London office at Palace Chambers, Westminster (Mr. F. Davis, who was long their agent at that address, having retired), and have appointed Messrs. Beck & Co., 130, Great Suffolk-street, Southwark, as their agents for London and the south and west of England.

CLASSES IN PHOTOGRAPHY, PHOTO-PROCESS, &C.—At the Polytechnic Institute, Regent-street, a series of lectures have been organised, to open on Monday next, on the practical photography and photo-process work, lithography, &c. The subject seems to have been fully considered, there is a large programme of instruction, and a number of lecturers and teachers engaged.

PRINTED GLASS TABLETS.—Messrs. Newell & Co. (London) send us specimens of a new method of executing printed inscriptions on white enamelled glass, which is both cheap and practically indestructible, except by actual breakage; the printed letters appear to be quite permanent, and cannot be scraped off or defaced.

GAS EXPLOSION IN THE STRAND.—An explosion of gas occurred on Tuesday evening in New Church-court, a passage leading from the Strand into Clare-market. About seven o'clock a terrific report was heard, and one of the houses in the court, No. 27, consisting of several stories, collapsed, carrying with it portions of the walls and roofs of the adjoining houses. The first explosion did not at first completely demolish one of the houses, for, although the lower part came down as far as the first floor, the upper stories were left in position, supported by some beams. When the Brigade arrived six firemen, including Fireman Sells and Fireman Spragg, were specially told off to search the ruins. They saw two bodies, one that of a woman, and while they were recovering them, the upper part of the house suddenly gave way, burying the men Sells and Spragg. The other four escaped. After about an hour's effort, his comrades rescued Sells, who was found to be suffering from nothing worse than an injured leg. Spragg, however, could not be found until five o'clock the next morning. Although outwardly Spragg was very little injured, his internal injuries were of a very serious nature, and he died after admission to King's College Hospital. The explosion affected the houses at the rear of New Church-court and on the north side of the Strand, all of which were damaged by the flying *débris* and broken glass.

A LARGE WHEEL FOR BLACKPOOL.—At the annual meeting of the Blackpool Winter Gardens Company on the 26th ult., the Chairman (Mr. J. Pearson) said a new dancing-hall, planned on modern lines, had already been commenced, and other schemes to which the directors were now committed included the building of new floral halls and of a new elevation to Victoria-street. Then, with the consent of the directors, a gigantic wheel, similar to that at Earl's Court, London, would be erected on land at present used as a bowling-green. Arrangements had been made with Mr. Bassett, the engineer and builder of the Earl's Court wheel, and it was proposed that this novelty should be ready for use by next season. Mr. Bassett said the new wheel would not be quite so large as that now working, but it would accommodate more people at one time, its capacity being four revolutions per hour, during which time it would carry 5,000 people.

RECREATION-GROUND, BILSTON, STAFFORDSHIRE.—A new recreation-ground, formed by the conversion of a disused graveyard attached to the Wesleyan Chapel, Oxford-street, Bilston, has just been opened.

NEW PARK, DEVONPORT.—On the 28th ult. the People's Park, Devonport, was opened by the Mayor (Mr. J. Bright James). Acquired a few years ago from the War Department, the freehold of the site is now vested in the Corporation, under whose direct supervision its appearance has been transformed into a picturesque spot, the outlay, including the conveyance, being about 10,000*l.* The grass plots have been relaid and planted by Messrs. Veitch & Sons, of Exeter, and intersecting paths have been formed.

IMPROVEMENTS AT BRIDLINGTON. — Several public improvements are to be carried out at Bridlington. A sea-wall is to be built, and upon it a promenade and marine walk, 36 ft. wide, and extending for a considerable distance, will be laid out. A sloping bank of grass will divide this from another wide promenade, flights of steps connecting the two. On a level with the second promenade gardens and lawns, with ornamental lake, fountain, band-stand, tennis-court, alcoves with sheltered seats, will be laid out and erected. A hall or sheltered promenade will be attached. A range of buildings for the recreation and amusement of visitors will also be provided, including a winter garden and a concert-hall, each capable of accommodating 3,000 people. A building will also be set apart for dancing. Reading, writing, and newsrooms, and a visitors' club with billiard-rooms will be attached. Ample dining-rooms, tea-rooms, and refreshment buffets will be provided; sea-water baths and a promenade pier are amongst the future projects. Hilderthorpe Lodge and the grounds attached are to be laid out as strawberry and tea-gardens, with athletic ground, bowling-green, and conveniences for other amusements. The whole of the gardens and buildings will be lighted by electricity and gas, in a similar style to that adopted at the Spa, Scarborough. Electric tramways will be laid throughout the estate. Mr. W. Beswick Myers, of Filey, has had charge of the plans.

"FUTURE EMPLOYMENT FOR ENGINEERS."—At a meeting of the Engineering Society of the University College, Bristol, on the 24th ult., Professor Ryan gave a lecture on "The Chances of Future Employment for those Intending to become Engineers." The lecturer said that trade was now beginning to revive, the reasons being—(1) People were recovering from the crashes in 1890, and were becoming venturesome again; (2) The new Government were spending large sums on new vessels for the Navy, &c., and this led to developments in the iron trades, also it provided work for the many artisans and others who, through lack of employment, had not been earning money, and therefore had not been spending it. All this would help towards fresh industries being started, and old ones revived, which in their turn would provide work for engineers in the future. The Professor then went on to say that they had a better chance than doctors and lawyers, since they made work for themselves. For instance, a railway might be constructed in a rich country, other work would immediately spring up, new towns be formed, machinery, ironwork, repairs and renewals for the railway would be wanted, all of which would have the desired effect. This, he said, was only one instance out of many. In the case of a doctor, his profession was for the one purpose of ridding the world of sickness, and then, as sanitation and other influences became perfected, the doctors would have less to do until sickness was to be no longer found upon the earth. In regard to the manufacture of mild steel by the Bessemer and Siemens-Martin processes, before those methods of manufacture were devised, steel cost as much as 40*l.* per ton, whereas now the price was nearer 4*l.* for a like quantity. This allowed of such undertakings as the Forth Bridge being carried out. Also, the Professor pointed out that for the manufacture of steel by those processes pure ore was an advantage. This had led to Bilbao, in Spain, being converted from a small town into a flourishing seaport, for from that place over two million tons of ore were now annually exported to England, chiefly for the purpose of being ultimately converted into mild steel.

HONOURS TO AN ENGLISH PAINTER.—Mr. Stanhope Forbes has received a first-class medal at the Munich Art Exhibition. We may be glad that this country was represented by an artist who illustrates some of the most special excellences of the modern school of English painting.

CAPITAL AND LABOUR.

SCOTTISH BUILDING TRADES' FEDERATION.—The annual meeting of this federation was held on the 23rd ult., in the Building Trades' Exchange, Gordon-street, Glasgow. There was a large attendance of representatives, the following places being represented:—Aberdeen, Alloa, Dumfries, Dundee, Edinburgh, Falkirk, Glasgow, Kilmarnock, Motherwell, Perth, Arbroath, &c. Mr. David Heron, Edinburgh, President, occupied the chair. The Secretary, Mr. James L. Selkirk, read a report by the executive on the progress made in promoting the federation throughout the country, from which it appeared that every local association had been communicated with, as well as a very large number of the leading firms in the various trades in all the principal towns throughout Scotland, and had been furnished with copies of the rules of the federation, and with full information regarding its objects. Gratifying responses were reported as having been received from most of the leading centres, and evidence furnished that the federation was warmly approved, and was fitted to render substantial assistance to local associations, as well as to promote the formation of such in those towns where they did not at present exist. The secretary read a paper on "Federation: its Objects and Advantages," in which he said that one of the leading characteristics of the present day was the growing tendency on the part of those who had interests in common to draw together and secure the benefits inseparable from combined effort. The building trades constituted one of the most important industries of the country, and included numerous branches, some of the principal of which had separate organisations, and had derived much advantage therefrom, but the lesser towns were generally found too small to render a local association of practical value. For some time past the necessity for a federation of the various branches of the building trades had been impressed upon the leading firms all over the country, and this feeling took definite shape some months ago in the formation of the present federation. Its main object was the formation on a distinct basis of an organisation which should embrace within its limits every branch of the building trades in Scotland, directed by an executive representative of the whole body. By this means united action on all matters affecting either particular branches of the general body could be satisfactorily taken. Such object was obviously as legitimate on the part of the employers as on that of the operatives, especially as they had large interests at stake which they were entitled to safeguard. The federation was further intended to promote the maintenance of cordial relations between employers and operatives, keeping in view how largely both parties were independent and their interests identical, and how much it was in the power of each to render the connexion something more than a mere pecuniary one. The cultivation of a feeling of thoughtful consideration it was believed would immensely promote due respect for each other's judgment and motives, so also would frank and occasional interchange of view on questions of common interest, and above all a readiness to refer to third parties those questions of importance in regard to which they were unable to see eye to eye. The labour problem was undoubtedly complex and far-reaching as well as of unusual magnitude. All the more, therefore, did it call for patient consideration, so that in circumstances of difference a solution might be arrived at without on either side the serious drawback resulting from inability to agree on main issues. No small part of the object to be gained by federation was the assistance and advice that might be rendered in the formation and working of branches in towns and districts. A hopeful movement has commenced in this direction, and there was every prospect that it would go forward until the entire country was organised. The relations of the building trades to architects and measurers, it was considered, could not be overlooked. While for the most part these were regarded as of a satisfactory kind, it would be the duty of the executive to use their influence on all fitting occasions to secure a fair and reasonable form of contract, the adoption of suitable rules for measuring work, and the prompt and satisfactory adjustment of contractors' accounts. —A general discussion followed, in which a number of representatives reported on the state of matters in their several towns, and numerous suggestions were made for the purpose of furthering the interests of the Federation, and particularly as to the formation of local associations. On the motion of Mr. Peterkin, Aberdeen, seconded by Mr. Hay, Edinburgh, the report was unanimously adopted, and the Secretary's paper was ordered to be printed and circulated. Various matters were remitted to the executive to be dealt with. Proceedings terminated with a vote of thanks to the Chairman.

NEW BRANCH OF THE NATIONAL ASSOCIATION OF OPERATIVE PLASTERERS, MANSFIELD, NOTTS. —A new branch of this Association has just been opened at Mansfield. A deputation from the Nottingham District, consisting of Mr. W. Morgan (President), Mr. H. Eaton (Vice-President), Mr. J. Daly (Secretary), and Mr. M. Daly (President of the Nottingham and District Building Trades Council), were present to perform the opening ceremony on behalf of the executive council. A large number of applications for membership were received.

BURY BUILDING TRADES' FEDERATION.—The monthly meeting of the Federation was held on the 16th ult. at Bury. The President, Mr. J. Lacklison, occupied the chair. Mr. J. Davis moved, seconded by Mr. D. Riley, that a sub-committee be appointed to revise rules and lay the same before a future meeting for consideration. It was resolved that the President, Mr. F. Martin, Mr. A. Spencer, along with the Secretary, be appointed the committee. A discussion took place with respect to the Masons' Society not being federated, and after some discussion the Secretary was instructed to write to them. The Slaters' delegate having reported several matters in connexion with their branch, the meeting was brought to a close.

LEGAL.

IMPORTANT POINT UNDER THE LONDON BUILDING ACT, 1894:

CASE IN THE DIVISIONAL COURT.

THE case of Tanner *v.* Oldham came before Mr. Justice Cave and Mr. Justice Wright, sitting as a Divisional Court of Queen's Bench, on Saturday last, it being an appeal by way of special case from the refusal of a Police Magistrate to convict under the London Building Act, 1894. The question which arose was whether a contract made before the passing of the Act of 1894, to erect a series of houses from year to year, came within the exemption in Section 212 of a contract entered into before the passing of the Act, under which a building, structure, or work is to be carried out.

The case stated that the respondent, a builder, on March 19, 1895, served on the appellant, who is the District Surveyor under the London Building Act, 1894, for the district of Hatcham, a notice which stated that he (the respondent) would build five dwelling-houses on the north side of Musgrave-road, in St. Paul's, Deptford. It appearing to the Surveyor that the houses proposed to be erected would be in contravention of the Act of 1894, he served a notice of objection under Section 150 of the Act. It was stated that the buildings proposed to be erected would be in accordance with the Building Acts in force before the Act of 1894 passed. On April 5 the respondent appealed to the Magistrate against the notice of objection. It was then proved that, under a building agreement of January 3, 1894, made between the Master and four wardens of the "Fraternity of the Art or Mystery of Haberdashers" and the respondent, the respondent agreed to erect not less than forty-three dwelling-houses, to be built of such classes and descriptions, in such position, in such manner, and otherwise as should have been previously approved of by the company's surveyor; and it was agreed that five of such houses should be erected on the north side of Musgrave-road, should be built at a cost of not less than 380*l.*, and that the plans, &c., should, previously to the commencement thereof, be submitted to and approved by the surveyor. It was also agreed that six houses should be finished before March 25, 1895, ten more in 1896, 1897, and 1898, and the remainder in 1899. It was also further agreed that all the works should be executed in accordance with the regulations of the Metropolitan Building Act and any other Act of Parliament, whether local or general, for the time being, affecting the premises. Section 212 of the London Building Act, 1894, enacts as follows:—Notwithstanding anything contained in this Act, a building, structure, or work which has been commenced before and is in progress at the commencement of this Act, or which is to be carried out under any contract entered into before the passing of this Act, may be completed subject to and in accordance with the provisions of the Acts relating thereto as are in force immediately previous to the passing of this Act.

Mr. Cripps, Q.C., who appeared with Mr. Daldy for the appellant, argued that the contracts exempted from the provisions of the Act of 1894, by Section 212, were not contracts such as that which had been entered into in the present case. The words of the Section, "Building, structure, or work," pointed to a contract for carrying out a particular building, and did not apply to a contract of such a general character as the present, which was to be in force for four years. The learned council said that it was not impossible that there might be contracts to take effect for a much longer period still. Again, the contract provided for fresh acts becoming applicable.

After hearing Mr. Jelf, Q.C., who appeared with Mr. J. P. Grain for the respondent, Mr. Justice Cave, in giving judgment, said that although the point was a small one, inasmuch as there was not much to be said about it, it was an important one. They (their Lordships) were asked to hold that the word "contract" in the Section meant specification, but if that had been intended it would have been very easy to have said so in the Section. The words, however, were very wide, and the contract in question came within them. The provision in the contract about the buildings being executed in accordance with any Act of Parliament for the time being affecting the premises did not carry the matter further, because the real question was, whether the Act applied to the contract at all. In these circumstances he thought that the decision of the magistrate was a right one.

Mr. Justice Wright concurring, the appeal was accordingly dismissed.

LONDON BUILDING ACT, 1894:

WOODEN BUILDINGS.

ON the 23rd ultimo, at the Southwark Police-court, Mr. C. S. Burtwell, of 14, Harper-street, New Kent-road, appeared in answer to two summonses taken out by Mr. Bernard Dicksee, District Surveyor for East Newington, &c., firstly, for erecting a building or structure without having given notice to the District Surveyor, as required by Sec. 145; secondly, for having erected a wooden structure without having previously obtained the licence of the County Council, contrary to Sec. 84.

Mr. Dicksee gave evidence to the effect that on the 14th ultimo he discovered that the defendant had erected a wooden building or structure 6 ft. 2 in. by 5 ft. 7½ in. by 7 ft. 6 in. high, roofed with corrugated iron, which had since been mounted on wheels. The defendant had not given him the necessary notice nor obtained the necessary licence from the Council. This was the second time that he had had to complain of the defendant putting up similar erections without giving notice, and had on the previous occasion warned him.

Mr. Fenwick, as defendant had previously been warned, fined him 40s. and costs in each case.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised.	Premiums.	Designs to be delivered.
*Plans for Sewage	Wantage U.D.C.	Two at 25 Guineas	Nov. 28

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
Two Houses, Bramley, near Leeds	.....	R. Wood	Oct. 31
Baths, &c. at Workhouse	Belfast Union	Young & Mackenzie	Nov. 5
Brewery, Barry Dock, Cardiff	F. J. Jones-Lloyd	.....	do.
Additions to Hospital	Goole U.D.C.	*Official*	do.
Additions to Infirmary, Fill-lane	Keighley Union	Judson & Moore	Nov. 6
Wood Paving (1,516 sq. yds.), High-street	Chatham Corp.	Chas. Day	Nov. 7
*Erection of Houses, &c. Tynemouth	Admiralty	*Official*	Nov. 8
Three Cottages and Lodge, Williamstown, near Dinas, Glam.	Morgan & George	W. H. D. Caple	Nov. 9
Guernsey Granite	Guildford Corp.	F. T. Maltby	Nov. 11
Widening part of Sutton-road	Kidderminster R.D.C.	G. J. Shepherd	do.
Paving, &c. Works, Linc. In-street	Kingsthorpe (Northants) U.D.C.	J. Ingman	do.
Guernsey Road Metal, near Sittingbourne	Milton U.D.C.	A. B. Acworth	do.
Council Chamber	Chipping Ongar R.D.C.	C. Pertwee	do.
Rebuilding Pear Tree Inn, Mirfield, Yorks	Webster & Sons, Lim.	Jackson & Fox	do.
Road and Sewers, Meadow Lawn Estate, Tonbridge	.....	Pomfret & Co.	do.
Additions to Premises	Dowlais (Glam.) Constitutional Club	*Official*	do.
*Granite	Lambeth Guardians	do.	Nov. 12
*Underground Conveniences	Com. of Sewers	do.	do.
*Sewer Work	Kensington Vestry	do.	do.
Cast-iron Pipes (705 tons), &c.	Pontypridd U.D.C.	E. Ross	do.
Sewerage Works	Atherton (Lancs) U.D.C.	Newton & Son	do.
Improvement Works, Bond-street, &c.	.....	W. B. G. Bennett	do.
Church Enlargement, Holy Trinity, Llandrindod Wells	.....	Nicholson & Hartree	do.
Pipe Sewers, &c. (6,450 yds.)	Oxenhope (Yorks) U.D.C	Barber, Hopkinson, & Co.	Nov. 14
*Workshops, &c. N.W. Fever Hospital	Metro. Asylums Bd.	Pennington & Son	do

CONTRACTS—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
House, Stables, &c. Llantarnam, near Newport, Mon.	W. F. Dawson	E. M. Bruce Vaughan	Nov.
Warehouse, Western Point Works, near Runcorn	Salt Union Ltd.	*Official*	do.
Schools, Bangor, Ireland	Rev. R. J. Morrell	.....	Nov.
Pipe Laying, Craigmaddie	Glasgow Corp.	Mr. Gale	Nov.
*Machinery, &c. for Waterworks	Huntingdon Corp.	R. E. Middleton	do.
*Additions to Workhouse	Windsor Union	Edgington & Summerbell	do.
*Convalescent Home, St. Leonards	Railway Mission Com.	F. H. Humphreys	do.
Chapel and House, Porth, Glam.	Salem Welsh Baptist Church Committee	H. Abraham	do.
Viaduct across the Clyde, Glasgow	Caledonian Ry. Co.	G. Graham	Nov.
Sewerage Works	Swadlincote U.D.C.	A. Marshall	do.
*Electric Light Installation, Brook Hospital	Metro. Asylums Bd.	Prof. Kennedy	do.
*Coroner's Court Buildings, Bethnal Green	London County Council	*Official*	Nov.
*Paving Works	Walthamstow U.D.C.	G. W. Holmes	Nov.
Sewerage Works, near Bury Bridge, Lancs	Bury Corporation	J. Cartwright	Nov.
*School, Portmadoc	The Local Governing Body	W. H. Dashwood Caple	Dec.
Stabling, &c. Shelton Brewery, Shelton, Staffs	Dix & Co.	R. Scrivener & Sons	Nov.
Additions, &c. to the District Asylum, Melrose, N.B.	Lunacy Board	Mitchell & Wilson	do.
Factory, Forster-street, Nottingham	.....	L. Bright	do.
Pair Semi-detached Villas, Esholt, Yorks.	.....	Empsall & Clarkson	do.
House, Trevena, Tintagel	.....	Wise & Wise	do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.
*Chief Electrical Engineer	Ealing U.D.C.	.....	Nov.
*Clerk of the Works	Wakefield Sch. Bd.	2*l.* 12*s.* 6*d.* weekly	Nov.
*Sanitary Inspectors (2)	St. Pancras Vestry	120*l.* each	Nov. 11
*Architectural Assistant	Newport Corp.	3*l.* weekly	do.

Those marked with an asterisk (*) are advertised in this Number. *Competition, p.* iv. *Contracts, pp.* iv., vi., viii., *&* xx. *Public Appointments, p.* xviii.

MEETINGS.

FRIDAY, NOVEMBER 1.

Sanitary Institute (*Lectures for Sanitary Officers*).—Mr. C. H. Cooper on "Principles of Calculating Areas, Cubic Space, &c.: Interpretation of Plans and Sections to Scale." 8 p.m.

Institution of Junior Engineers.—Presidential Address, to be delivered by Mr. A. Denny. 8 p.m.

SATURDAY, NOVEMBER 2.

London County Council, Technical Education Board (*The Study of Architecture*).—Mr. W. R. Lethaby's second lecture on "Modern Building Design," at the Central Art Department of the Board, Bolt-court, Fleet-street. 3.30 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Inspection of Express Dairy Company's Farm, College Farm, Finchley. 3 p.m.

Sanitary Inspectors' Association (*Carpenters' Hall*).—Annual Address of the Chairman, Mr. H. Thomas. 6 p.m.

Proposed Builders' Clerks' Institution of Great Britain.—Meeting at the Westminster Town Hall, Room 13, 5 p.m.

MONDAY, NOVEMBER 4.

Royal Institute of British Architects.—Presidential Address by Mr. F. C. Penrose, F.R.S. 8 p.m.

Society of Engineers.—Mr. T. Andrews, F.R.S., on "The Effect of Strain on Railway Axles and the Minimum Flexion Resistance-point in Axles." 7.30 p.m.

TUESDAY, NOVEMBER 5.

Sanitary Institute (*Lectures for Sanitary Officers*).—Dr. George Reid on "Sanitary Appliances." 8 p.m.

Society of Biblical Archæology.—8 p.m.

Glasgow Architectural Association.—Mr. Hugh Dale on "Organ Building." 8 p.m.

WEDNESDAY, NOVEMBER 6.

Carpenters' Hall, London Wall (*Lectures on Building and Sanitary Construction*).—Professor H. Robinson on "Sanitary Requirements." 8 p.m.

British Archæological Association.—The Rev. F. H. Moyle, M.A., on "The Frescoes in Ashampstead Church, Berks"; (2) Mr. James Bine on "Findlater Castle, Banffshire." 8 p.m.

Royal Archæological Institute.—General meeting:—(1) Mr. Edward Peacock, F.S.A., on "Garlands"; (2) Mr. F. C. Hilton Price, F.S.A., on "Signs of Old Fleet-street." 4 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Inspection in the Parish of St. George's, Hanover-square. 2 p.m.

St. Paul's Ecclesiological Society.—Mr. R. A. S. Macalister on "The Ecclesiology of Ogham Inscriptions." 7.30 p.m.

Builders' Foremen and Clerks' of Works Institution.—Ordinary meeting of the members. 8 p.m.

FRIDAY, NOVEMBER 8.

Architectural Association.—Mr. Talfourd Ely, M.A., on "Pompeii"—with lantern illustrations. 7.30 p.m.

Sanitary Institute (*Lectures for Sanitary Officers*).—Professor T. Roger Smith on "Sanitary Building Construction." 8 p.m.

SATURDAY, NOVEMBER 9.

Sanitary Institute (*Lectures for Sanitary Officers*).—Visit to the Sewage and Destructor Works, Ealing. 2.15 p.m.

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

18,394.—DISINFECTING APPARATUS: *C. Williams.*—This patent relates to an apparatus for water-closets, and consists of a perforated metal box containing a solid disinfectant which is gradually dissolved by being suspended in the water of the flushing cistern.

21,434.—DOORS, WINDOWS, &C.: *T. Moy.*—This invention consists in utilising the following compound motion for manipulating the above and analogous articles. A cylinder, or its equivalent, is caused to receive angular reciprocating motion and longitudinal reciprocating motion simultaneously upon its axis, so that different points upon the surface of such cylinder will describe a similar line of motion. Racks and pinions are used to render these motions applicable for the purposes mentioned.

22,529.—WATER-CLOSETS: *S. Rowley.*—Relates to the manufacture of closets in which the basin and trap are in one piece of earthenware. Consists in moulding the basin with a shoulder or flange around the outside of the outgo, uniting basin and trap together, either while the clay is soft or in the biscuit stage, and afterwards firing and finishing in the ordinary way.

22,675.—PAINT BRUSHES AND TINS: *D. Macpherson.*—A combined paint brush and lid for paint-tins. The tube, or ferrule, which holds the bristles is passed through the lid, an air-tight joint being made between ferrule and lid by soldering or other means.

24,509.—HINGES: *G. Martineau.*—Deals with a method for connecting the short joint-pins of loose pin butt-hinges to the knuckles of such hinges. An annular projection or collar is made on the pin to be attached, and a corresponding depression in the knuckle-piece of the sheet-metal flap of the hinge is arranged to engage with said collar when the knuckle-piece is bent into a tubular shape.

14,778.—FASTENING DOORS: *L. Grossman.*—To prevent unauthorised opening, the door is provided with a sheet steel covering, and electrical alarm signal contacts. It is prevented from being lifted off its hinges by a plate or stop above the same, and is also provided with guides between which a slide can move to and fro, unless prevented by bolts which can only be withdrawn by the agency of safety-locks. Other minor precautions are also specified.

15,167.—BUILDING BLOCKS, &C.: *C. Voltz.*—Consists in putting fibres of alfa or esparto grass in mortar (cement, air mortar, fireproof mixtures, and the like), and laying the mass on, either in layers on supports, or forming it into slabs for building.

15,546.—FIRE-GRATE: *A. Scott.*—A fire-box or grate for domestic purposes, constructed to rotate on an axis or pivot, and also arranged to be readily detachable from its fixed frame.

NEW APPLICATIONS FOR LETTERS PATENT.

OCTOBER 14.—19,226, G. Gardner and The Automatic Chain Company, Ladders.—19,237, A. Tomlins, Jointed Woather-brick and Tile Combined.

OCTOBER 15.—19,288, H. Hallett, Stop-cocks.—19.291, H. Hallett, Waste and other Water-closet apparatus.—19,299, H. Brice and J. Jones, Syphon-flushing Cisterns or Water-waste Preventers.—19,345, J. Keene, Spring-hinges for Doors, &c.—19,354, R. McMiellen, Balancing and locking Window-sashes.—19,356, E. Thomas, Kilns.

OCTOBER 16.—19,403, J. Boyd-Wilson, Bricks.—19,404, J. Boyd-Wilson, Flooring.—19,431, P. Purcell, Countersinking and Screw-driving Tools. 19,437, T. Smith, Planes,—17,457, E. Weidlich, Ventilating and Smoke-preventing apparatus.

OCTOBER 17.—19,472, W. Ralph, Door Stop and Spring.—19,535, H. Webb and H. Harvey, Door-fasteners, &c.

OCTOBER 18.—19,560, G. Mackie, Door-closing Apparatus.—19,561, S. Hill and G. Mackie, Door-checking Apparatus.—19,575, E. Smith, Window-sashes and Frames.—19,597, W. Walter, Conduits for Sewers, &c.—19,610, W. Youlten, Window-fasteners.

OCTOBER 19.—19,703, C. Cross, Household Water Supply.

PROVISIONAL SPECIFICATIONS ACCEPTED.

16,880, F. Bates, Stench-trap.—17,216, W. Allen, Roof Glazing.—17,494, B. Gypson, Attaching Door-knobs to their Spindles.—17,545, H. Sutcliffe, Water-closet Basins.—17,680, S. Chantrill, Water-closets, Slop-sinks, &c.—17,787, F. Keep, Gates.—17,853, W. Youlten, Cheeks of Hopper Windows.—17,856, W. Thompson, Drying.—17,895, L. Ower, Fittings of Sash-windows to facilitate the Cleaning thereof.—17,966, A. Roe, Chimney-pots.—18,069, F. Hooper, Ladders.—18,097, E. Hall, Sash-windows.—18,326, G. de Bruyn, Fireproof Ceilings.—18,409, G. de Bruyn, Fireproof Ceilings.—18,495, G. de Bruyn, Ceilings.—18,523, A. Davey, Draught-excluder for Doors.—18,655, W. Youlten, Casements.

COMPLETE SPECIFICATIONS ACCEPTED.

(*Open to Opposition for Two Months.*)

20,517, F. Prince, Ventilators.—22,633, J. Leuba, Paving-stone.—24,663, L. Marsden, Chimney-tops.—4,704, W. Moore, Flooring or Boxing for Hearths.—1,368, A. Widmann, House Bell.—12,562, R. Hooker, Sash-fastener.—17,536, W. Thompson, Sharpening and Setting Saws.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

OCTOBER 2.—By *W. N. Lewendon & Son* (at Hull): 81 houses, Newland-av., &c., Hull, Yorks., f., r. 1,293*l.*, 14,000*l.*

OCTOBER 8.—By *Humbert, Son, & Flint* (at Watford): 115, Gladstone-rd., Watford, Herts., f., r. 25*l.*, 250*l.*; a plot of bldg. land, St. James'-rd., f., 10*l.*; 112, High-st., f., r. 30*l.*, 750*l.*; "Lismore Cottage," Main-rd., Bushey, Herts., f., 475*l.*; freehold brickfields, Paddock-rd., containing 5 a. 2 r. 21 p., together with the goodwill, 1,300*l.*

OCTOBER 10.—By *Nock, Cooper, & Co.* (at Tuck Hill): Broad Lanes Farm, Alveley, Salop, 20 a. 1 r. 27 p., f., 520*l.*

OCTOBER 11.—By *C. & H. White:* I.g.r. 50*l.*, Brixton-rd., Brixton, u.t. 4 yrs., g.r. 32*l.*, 35*l.*; 52, Denmark-rd., Camberwell, f., e.r. 32*l.*, 450*l.*—By *C. H. Brown;* 18, 20, 22 and 24, Vincent-st., Westminster, u.t. 13½ yrs., g.r. 24*l.*, 300*l.*—By *Tyser & Chamberlain:* 484, Edgware-rd., Paddington, u.t. 14 yrs., g.r. 8*l.*, r. 60*l.*, 425*l.*; A f. house and shop, London-rd., Kingston-Surrey, r. 30*l.*, 420*l.*; 78, High-st, Barnet, Herts., c.r. 52*l.* 10*s.*, 1,350*l.*; 48 and 50, Cambridge-rd, Gunnersbury, u.t. 61 yrs., g.r, 12*l.*, r. 70*l.*, 600*l.*—By *R. Austin* (at Southampton): "Wilkin's Farm," Netley Hill, Hants, 16 a. 0 r. 35 p., f, 825*l.*; a freehold cottage, and 2 a. 3 r. 27 p., r. 15*l.*, 300*l.*—By *W. Houghton* (at Walthamstow): a plot of land, Palmerston-rd., Walthamstow, f., 150*l.*; eleven plots of land, Coleridge-rd., f., 520*l.*—By *E. Harland* (at Scarborough): 11, Westborough, Scarborough, Yorks., f., 7,000*l.*

OCTOBER 12.—By *Francis Pittis & Son* (at Newport): "Blackland's Farm," Arreton, Isle of Wight, 50 a. 1 r. 7 p., f., 2,100*l.*—By *Harrison & Sons* (at Buckingham): A freehold farm and two enclosures of land, Adstock, Bucks, 65 acres, 2,225*l.*; a freehold farm, Akeley, Bucks., containing 35 acres, 1,150*l.*; a freehold residence and 18 acres, 1,020*l.*

OCTOBER 14.—By *E. Millard:* F.g.r. of 150*l.* Cook's-rd., Stratford, reversion in 72 yrs., 5,070*l.*; "Bellair," London-rd., Reigate, f., 1,220*l.*—By *Fuller, Horsey, Sons & Cassell:* "Northcroft Cottage," Wooburn Green, Bucks., and 17 a. 1 r. 30 p., f., r., 75*l.*, 1,500*l.*; a

freehold residence with stabling, r. 15*l.*, 215*l.*—By *R. & J. Mitchell* (at Cockermouth): "Appleton Hall," Bridekirk, Cumberland, and 8 a. 0 r. 17 p., f., 1,000*l.*; "Bonnyhill Farm," 78 a. 3 r. 34 p., f., 1,300*l.*

OCTOBER 15.—By *Blake & Carpenter:* 338, 340, and 342, London-rd., Thornton Heath, f., r. 165*l.*, 1,940*l.*—By *Debenham, Tewson & Co.:* "Rycroft," and "Butcher's Farm," Bolney, Sussex, 5 a. 2 r. 16 p., f., 1,280*l.*—By *Bowditch & Grant:* 103, 105 and 107, Maple-rd., Penge, u.t. 70 yrs., g.r. 24*l.*, r. 116*l.*, 840*l.*—By *T. B. Westacott:* 14, Woodberry Grove, Finsbury-pk., u.t. 67 yrs., g.r. 10*l.* 10s., e. r. 60*l.*, 450.—By *Franklin & Jones* (at Thame): An enclosure of land, Towersey, Bucks., 4 a. 2 r. 16 p., f., 225*l.*—By *H. Duke & Son* (at Charminster): The Dorset County School Estate, Charminster, Dorset, containing 10 acres, f., 4,800*l.*—By *Nichols, Smith, & Alder* (at Yatton): An enclosure of land, Clevedon, Somerset, 6 a. 2 r. 3 p., f., 430*l.*

OCTOBER 16.—By *Hobson, Richards, & Co.:* 85, Boulton-rd., Southsea, Hants., f., r. 13*l.*, 117*l.*—By *Slade & Butler:* 49, Sidney-st., Cambridge, u.t. 35 yrs., gr. 30*l.*, r. 123*l.*, 1,010*l.*—By *C. & H. White:* 81 and 83, Dorset-rd., Clapham, u.t. 26 yrs., g.r. 8*l.* 5s., r. 68*l.* 8s., 285*l.*; 42 to 45, Wootton-st., Lambeth, u.t. 16¾ yrs., g.r. 32*l.*, r. 132*l.* 12s., 400*l.*; 1A and 2, Hatch-row, f., r. 52*l.*, 400*l.*—By *Foster & Cranfield:* 173 to 181 (odd), Church-st., Stoke Newington, f., r. 215*l.*, 3,920*l.*; i.g.r. of 28*l.*, Sandringham-rd., Dalston, u.t. 65½ yrs., g.r. nil, 670*l.*—By *J. J. Hill & Weaver:* I.g.r. of 98*l.* 12s., New-rd., Battersea, u.t. 20 yrs., g.r. 40*l.*, 665*l.*; f.g.r. of 16*l.*, Doggett-rd., Catford, reversion in 78 yrs., 300*l.*; f.g.r. of 48*l.*, Mercy-ter., &c., Ladywell, reversion in 70 yrs., 1,230*l.*; 59, Ladywell-rd., f., r. 60*l.*, 1,070*l.*; 2 and 3, Mason's-hill, Bromley, Kent, f., 1,060*l.*; a profit rental of 103*l.* 10s., South End-rd., &c., Sydenham, u.t. 52 yrs., with reversion, 1,750*l.*; a profit rental of 105*l.* 10s., Dermody-rd., Lewisham, u.t. 71 yrs, with reversion, 2,160*l.*—By *S. Walker & Runtz:* 20, Rutland-st., Whitechapel, u.t. 11 yrs., g.r. 2*l.*, r. 26*l.*, 90*l.*; an enclosure of land, Fordwich, Kent, 1 a. 1 r. 32 p., 130*l.*—By *W. Houghton* (at Walthamstow): 2, 14, 16, 18, and 20, Hawthorn-rd., Walthamstow, u.t. 84 yrs., g.r. 15*l.*, 600*l.*—By *A. Richards* (at Tottenham): F.g.r. of 10*l.*, High-rd., Tottenham, reversion in 88 yrs., 265*l.*; 905, 907, and 909, High-rd.; 4 to 8, Blackman's-row, and about 3 a., f., 1,250*l.*; 1 to 9, Chapel-ter., Edmonton, f., r. 128*l.* 14s., 1,310*l.*; 1 and 2, Rose Cottages, Tottenham, f., r. 24*l.* 14s., 190*l.*; three enclosures of land, Tottenham Marshes, 1 a. 1 r. 29 p., f., 52*l.*—By *H. Campion* (at Louth): Two cottages and enclosures of land, Covenham, Lincs., 31 a. 0 r. 14 p., f., 882*l.*—By *Harman Bros.* (at Wickford): Twenty-one plots of freehold bldg. land, Wickford, Essex, 1,745*l.*—By *N. Easton & Son* (at Hull); "Owmer House Farm, Withernwick, Yorks., 195 acres, f., 7,000*l.*; "North End Farm," 149 acres, f., 4,200*l.*; a freehold farm, Flinton, Yorks., containing 158 acres, f., 5,000*l.*

OCTOBER 17.—By *M. Liell & Son:* 2, Wallwood-ter., Leytonstone, f., e.r., 26*l.*, 310*l.*; 1 to 9 (odd), Ranwell-st., Bow, u.t. 67 yrs., g.r. 17*l.* 10s., r. 91*l.*, 315*l.*—By *H. J. Bliss & Sons:* 36, Hilldrop-cres., Holloway, u.t. 53 yrs., g.r. 5*l.* 10s., e.r. 55*l.*, 400*l.*; 64, Grafton-st., Mile-end, u.t. 34 yrs., g.r. 3*l.* 3s., 250*l.*; 74 and 76, Grafton-st., u.t. 31 yrs., g.r. 5*l.* 10s., 500*l.*—By *Newbon & Co.:* 2 to 10 (even), Norman-st., St. Luke's, u.t. 40 yrs., g.r. 35*l.*, r. 225*l.*, 1,295*l.*; 27, 28, and 29, Helmet-row, u.t. 53½ yrs., g.r. 20*l.*, r. 125*l.*, 620*l.*; Helmet-row, i.g.r. of 62*l.* 10s., u.t. 53½ yrs., g.r. 25*l.*, 605*l.*; 2 and 2a, Almorah-rd., Islington, u.t. 52 yrs., g.r. 4*l.* 1s., r. 66*l.*, 530*l.*; 13, Westmoreland-pl., City-rd., f., r. 120*l.*, 1,270*l.*—By *R. Temple* (at Margate): "Grongar House," Canterbury-rd., Margate, f., r. 65*l.*, 88*l.*; 2 plots of building land, Crescent-rd., &c., f, 81*l.*; "Osborn House," Sea-rd., Westgate-on-Sea, Kent, f., 2,500*l.*; a plot of building land, Harold-rd., f., 27*l.*—By *F. B. Capon* (at Manningtree): "Lufkins Farm," Dedham, Essex, 23 a. 2 r. 7 p., f. and c., 470*l.*: an enclosure of land, 2 a. 3 r. 15 p., f., 75*l.*—By *G. Nichols, Smith, & Alder* (at Bristol): "Hayes Farm," Pilning, Glos., 16 a. 0 r. 36 p., f., 1,400*l.*; three enclosures of land, 8 a. 2 r. 15 p., f., 550*l.*

OCTOBER 18.—By *Parsons & Co.:* 6, Bismarck-rd., Holloway, u.t. 88 yrs., g.r. 8*l.*, r. 36*l.*, 285*l.*; 58 to 68 (even), Ambler-rd., Finsbury Pk., u.t. 73 yrs., g.r. 33*l.*, r. 228*l.*, 1,920*l.*—By *J. A. & W. Tharp:* 1, 3, and 5, Cygnet-st., Bethnal Green, 3, Bacon-st., and "The Plough," beerhouse, u.t. 50 yrs., g.r. 21*l.*, r. 203*l.* 12s., 1,300*l.*; 19 and 21, Harvey-rd., Leytonstone, f., r. 59*l.* 16s., 610*l.*; i.g.r. of 18*l.*, Alpha-pl., Kilburn, u.t. 62 yrs., g.r. 2*l.*, 320*l.*; i.g.r. of 6*l.*, Bridge-st., u.t. 63 yrs., g.r. 2*l.*, 80*l.*; 6, Union-st., Stratford, f., r. 18*l.* 4s., 175*l.*—By *Franklin & Son* (at Thaxted): "Buckingham's Farm," Thaxted, Essex, 119 a. 3 r. 27 p., f., 1,010*l.*—By *W. H. Horsley* (at Cheltenham): 134, High-st., Cheltenham, Glos., f., r. 24*l.*, 4,000*l.*; the Candle Factory, Sherborne-st., f., r. 50*l.*, 500*l.*; 6, Winchcomb-st., f., r. 38*l.* 14s., 652*l.*—By *G. Tinker & Son* (at Wakefield): "Lane End Colliery," Flockton, Yorks., comprising 99 a. 2 r. 26 p., f., 3,450*l.*; eleven f. cottages and 2 a. 1 r. 3 p., 585*l.*; six enclosures of land, 33 a. 1 r. 39 p., f., 1,099*l.*; "Flockton Corn Mill," house, &c., 16 a. 0 r. 24 p., f., 635*l.*; six enclosures of land, 18 a 1 r. 32 p., f., 505*l.*; freehold farm premises and 7 a. 0 r. 3 p., 370*l.*; fifteen enclosures of land, 91 a. 3 r. 28 p., f., 1,481*l.*; nine houses and enclosure of land, 37 a. 1 r. 4 p., f., 1,022*l.*

OCTOBER 21—By *Churton, Elphick, & Co.* (at Whitchurch): A f. farm, Broughall, Salop, containing 12 a. 2 r. 17 p., 830*l.*—By *Mullett, Booker, & Co.:* 120, Gloucester-ter., Hyde Pk., u.t. 44½ yrs., g.r. 30*l.*, 900*l.*—By *Ventom, Bull, & Cooper:* 110, Denbigh-st., Pimlico, u.t. 33½ yrs., g.r. 10*l.* 10s., e.r. 70*l.*, 500*l.*; "Malvern" and "Nottoway," Oakhill-rd., Putney, f., r. 96*l.*, 1,520*l.*; 35, 37, and 39, Schubert-rd., f., r. 136*l.* 10s., 2,120*l.*; 6, 8, 10, and 12, Frogmore, u.t. 95¾ yrs., g.r. 14*l.*, r. 104*l.*, 900*l.*—By *Elliott, Son, & Boyton:* 66, 68, 70, 72, and 76, St. John's-rd., Wandsworth, u.t. 88¼ yrs., g.r. 80*l.*, r. 425*l.*, 6,005*l.*; 52, 54, and 56, Wimbledon Hill-rd., Wimbledon, u.t. 84½ yrs., g.r. 53*l.* 11s., r. 310*l.*, 5,130*l.*; 1 and 2, Worple Mews, f., r. 52*l.*, 975*l.*; Nos. 61 and 63, Shaftesbury-av., u.t. 63 yrs., g.r. 120*l.*, 5,840*l.*; 8, South-st., Marylebone, u.t. 27½ yrs., g.r. 34*l.* 735*l.*; 40, Corbyn-st., Holloway, u.t. 75 yrs., g.r. 6*l.*, r. 30*l.*, 240*l.*—By *Mackinder, Parish & Co.* (at Spilsby): a cottage and four enclosures of land, Bolingbroke, Lincs., 13a. 1r. 33p., c., 582*l.*—By *C. H. Sharp & Son* (at Spilsby): three enclosures of land, Toynton St. Peter, Lincs., 18a. 1r. 9p., f. 550*l.*—By *G. F. Attree* (at Brighton): 1 to 5, Robbins-row, Portslade, Sussex, f., r. 41*l.* 3s. 4d., 440*l.*; a messuage, granary, &c. f. and c., r. 35*l.*, 520*l.*; two enclosures of land, 10a. 2r. 6p., f., 1,085*l.*; a freehold farm, containing 31 a. 1r. 20p., f., 3,425*l.*; four enclosures of land, 43 a. 2r. 4p., f., 3,310*l.*; "East Hill Farm," 65 a. 0 r. 14 p., f., 2,300*l.*; enclosures of market garden and bldg. land, 32 a. 1 r. 4 p., f., 1,415*l.*

OCTOBER 22.—By *Bean, Burnett, & Eldridge:* 92, North Side, Wandsworth, f., r. 45*l.*, 1,000*l.*; "Felsham Hall Farm," Felsham, Suffolk, 150 a. 3 r. 21 p., f., 1,230*l.*; "Gedding Hall Farm," Gedding, Suffolk, 113 a. 1 r. 20 p., f., 1,000*l.*; "Abbott's Farm," Bradfield St. George, Suffolk, 91 a. 3 r. 16 p., f., 600*l.*—By *W. Houghton:* 220, Richmond-rd., Hackney, u.t. 50 yrs., g.r. 6*l.* 10s., e.r. 45*l.*, 300*l.*; 2 to 18 even, Beaumont-rd., Leyton, f., r. 123*l.* 10s., 1,190*l.*; a block of bldg. land, High-st., f., 600*l.*—By *Debenham, Tewson, & Co.:* 4, Angel-crt., City of London, f., e.r. 1,000*l.*, area 750 sq. ft., 14,000*l.*; a freehold residence, Wickham Market, Suffolk, 1 r. 11 p., r. 32*l.*, 66*l.*; two freehold houses and enclosures of land, 21 a. 1 r. 10 p., 1,532*l.*; two enclosures of copyhold land, 4 a. 1 r. 7 p., 225*l.*; two enclosures of land, Marlesford, Suffolk, 6 a. 2 r. 6 p., 255*l.*—By *Boyton & Pegram* (at Walham Green): 31 and 33, Rectory-rd., Fulham, u.t. 94 yrs., g.r. 10*l.* 10s., 570*l.*; 14, 16, and 20, Eddiscombe-rd., u.t. 94½ yrs., g.r. 16*l.* 10s., 945*l.*—By *J. & W. Heathcote* (at Bakewell): "Pike Hall Farm," Bradbourne, Derby, 93 a. 2 r. 33 p., f., 1,900*l.*; "Brundcliff Farm," Hartington, Derby, 246 a. 3 r. 8 p., f., 3,950*l.*; "Parsley Hay Farm," 47 a. 1 r. 14 p., f., 850*l.*; "Old House Farm," 179 a. 0 r. 39 p., f., 2,925*l.*; five enclosures of land, Youlgreave, Derby, 15 a. 3 r. 5 p., f., 500*l.*

OCTOBER 23.—By *Douglas Young:* 8, 9, 10, 11, 17, and 20, Rook-st., Poplar, f., r. 88*l.* 8s., 570*l.*—By *F. J. Bisley & Sons:* 9 and 11, Parfit-rd., Rotherhithe, u.t. 62 yrs., g.r. 8*l.*, 455*l.*; 65, Rolls-rd., Bermondsey, u.t. 51 yrs., g.r. 5*l.*, r. 38*l.*, 235*l.*; 1 to 5, Townshend cottages, St. John's Wood, u.t. 24½ yrs., g.r. nil, r. 160*l.* 9s., 1,130*l.*—By *Ellis, Morris, & Co.:* 200, Goldhawk-rd., Shepherd's Bush, u.t. 46½ yrs., g.r. 5*l.*, e.r. 40*l.*, 285*l.*; "Hill End Court Estate," Castlemorton, Worcester, 544 a. 0 r. 20 p., f. and c., 5,700*l.*—By *Hunter & Hunter:* 2A, Rochester-mews, Hyde-pk., u.t. 43¼ yrs., g.r. 7*l.*, 230*l.*; 15, Peel-st., Kensington, u.t. 59 yrs., g.r. 8*l.*, r. 46*l.*, 395*l.*—By *Farebrother, Ellis, Clark, & Co.:* 1, Castle-ct., City of London, f., r. 215*l.*, 3,140*l.*; 4, Beverley Villas, Barnes, u.t. 61½ yrs., g.r. 8*l.* 15s., e.r. 65*l.*, 630*l.*; 147A and 149, Cambridge-rd., Bethnal Green, f., r. 30*l.*, 600*l.*; "The Carpenters' Arms" public-house, Cambridge-rd., f., r. 56*l.*, 1,250*l.*; 153, 155, 157, and 173, Cambridge-rd., f., r. 104*l.*, 1,780*l.*; 159 and 179, Cambridge-rd., f., r. 30*l.*, 610*l.*; 161 to 171 (odd), 175 and 177, Cambridge-rd., f., r. 178*l.* 16s., 3,690*l.*—By *Bean, Burnett, & Eldridge* (at Dorchester): "Bingham's Melcombe Estate," Melcombe Bingham, Dorset, comprising 27 acres, f., 4,200*l.*; "Melcombe Newton Farm," 677 a. 3 r. 35 p., f., 5,850*l.*; "Cothay's Farm," 232 a. 3 r. 32 p., f., 2,075*l.*; "Peck Mills," 4 a. 0 r. 18 p., f., 430*l.*; five enclosures of land, 53 a. 3 r. 0 p., f., 915*l.*; house and shop and five cottages, f., 275*l.*; "Bingham's Woolcombe Farm," Great Toller, &c., Dorset, 296 a. 0 r. 5 p., f., 3,050*l.*; "Quarr Farm," Swanage, near Dorset, 72 a. 1 r. 4 p., f., 1,005*l.*—By *King & King* (at Portsea): "The Portsmouth Park Racecourse," Farlington, Hants, comprising 430 a. 2 r. 17 p., f., 20,000*l.*—By *Fuller, Moon, & Fuller* (at Croydon); a freehold residence and plot of land, Ancaster-rd., Beckenham, 350*l.*; a plot of bldg. land Ancaster-rd., f., 50*l.*; 1 to 4, Manor-pl., Wallington, u.t. 287½ yrs., g.r. nil, 500*l.*; eight plots of bldg. land, London-rd., Croydon, f., 548*l.*; six plots of bldg. land, Broughton-rd., f., 410*l.*—By *Newland, Davies, & Hunt* (at Newport, Mon.): "Malpas Farm," Bettws, Mon., 130 a. 1 r., f., 6,575*l.*—By *Eddison & Taylor* (at Golcar): Three cottages, farm buildings, and 2a. 3 r. 37 p., Golcar, Yorks., f., 205*l.*; a freehold house, 100*l.*

OCTOBER 24.—By *Dyer, Son, & Hilton:* "Warwick House," Denmark-rd., Carshalton, f., 1,600*l.*—By *C. C. & T. Moore:* 11, Harley-st., Bow, u.t. 30 yrs., g.r. 5*l.* 5s., r. 32*l.*, 260*l.*; 131 and 133, Salmon's-lane, Limehouse, f., r. 85*l.*, 1,100*l.*; 180 and 182, Rhodeswell-rd, f., r. 41*l.* 12s., 240*l.*

[*Contractions used in these Lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent, r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.

Greenheart, B.G.	ton	8/0/0 — 9/0/0
Teak, E.I.	load	10/0/0 — 16/0/0
Sequoia, U.S. ft. cu		1/7 — 1/10
Ash, Canada load		3/0/0 — 4/5/0
Birch, do.		2/0/0 — 3/5/0
Elm, do.		3/15/0 — 5/0/0
Fir, Dantsic, &c.		2/0/0 — 3/10/0
Oak, do.		2/15/0 — 4/15/0
Canada		6/5/0 — 7/15/0
Pine, Canada	red	0/0/0 — 0/0/0
Do. Yellow		2/10/0 — 4/15/0
Lath, Dantsic, fath		4/10/0 — 5/10/0
St. Petersburg		5/0/0 — 6/10/0
Wainscot, Riga, &c., log		2/15/0 — 5/0/0
Odessa, crown		2/15/0 — 5/0/0
Deals, Finland		
2nd & 1st std		7/0/0 — 8/10/0
Do. 4th & 3rd		7/0/0 — 8/0/0
Do. Riga		7/0/0 — 8/0/0
St. Petersburg, 1st yellow		9/10/0 — 12/0/0
Do. 2nd yellow		7/10/0 — 9/0/0
Do. white		8/0/0 — 9/10/0
Swedish		7/0/0 — 15/10/0
White Sea		7/5/0 — 14/0/0
Canada, Pine	1st	21/0/0 — 24/0/0
Do. do.	2nd	16/0/0 — 17/0/0
Do. do.	3rd, &c.	8/0/0 — 10/0/0
Do. Spruce, 1st		9/0/0 — 10/10/0
Do. do.	3rd and 2nd	6/10/0 — 7/10/0
New Brunswick		6/0/0 — 7/0/0
Battens, all kinds		5/0/0 — 21/0/0
Flooring boards, sq., 1 in. prep.		
1st		0/9/6 — 0/14/6
Do. 2nd		0/6/6 — 0/11/6
Other qualities		0/4/6 — 0/7/6
Cedar, Cuba	ft.	3d — 4½d
Honduras, &c.		3d — 4d
Mahogany, Cuba		3 — 6
St. Domingo, cargo av.		3 — 1/0
Mexican do. do.		3 — 4
Tobasco do. do.		3d — 6
Honduras do.		3d — 5d
Box, Turkey	ton	4/0/0 — 15/0/0
Rose, Rio		7/0/0 — 16/0/0
Bahia		6/0/0 — 15/0/0
Satin, St. Domingo		0/0/5 — 0/1/0

TIMBER (*continued*).

Satin, Porto Rico		0/0/6 — 0/1/6
Walnut, Italian		0/0/3 — 0/0/7

METALS.

Iron—Pig, in Scotland	ton	2/6/10 — 0/0/0
Bar, Welsh, in London		5/12/6 — 5/15/0
Do. do. at works in Wales		5/2/6 — 5/5/0
Do. Staffordshire, in London		6/0/0 — 6/10/0
COPPER—British cake and ingot		48/15/0 — 49/5/0
Best selected		49/5/0 — 49.15.0
Sheets, strong		56/0/0 — 0/0/0
Chili bars		44/17/6 — 45/2.6
YELLOW M'TAL		0/0/4 9-16 — 0/0/4⅝
LEAD—Pig, Spanish	ton	11/7/6 — 11/8/9
English com. brands		11/10/0 — 11/11/3
Sheet, English, 6 lbs. per sq. ft. and upwards		12/10/0 — 12 12 6
Pipe		12/10,0 — 0/0/0
ZINC—English sheet	ton	18/5 0 — 18/10/0
Vieille Montagne		18/15/0 — 0/0/0
TIN—Straits		65/12/6 — 66/2/6
Australian		66/12/6 — 67/2/6
English Ingots		68/15/0 — 69/0/0
Banca		66/10/0 — 66/15/0
Billiton		66/0/0 — 66/5/0

OILS.

Linseed	ton	20/5/0 — 20/12/6
Cocoanut, Cochin		25/0/0 — 0/0/0
Do. Ceylon		22/15/0 — 0/0/0
Palm, Lagos		23/10/0 — 0/0/0
Rapeseed, English pale		23/10/0 — 23/15/0
Do. brown		22/0/0 — 22/5/0
Cottonseed ref.		17/0/0 — 17/10/0
Oleine		19/10/0 — 20/10/0
Lubricating, U.S.		5/6/0 — 8/0/0
Do. black		4/9/0 — 6/6/0
TAR—Stockholm	barrel	0/19/6 — 0/0/0
Archangel		0/15 0 — 0 0/0

TENDERS.

[Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays.* N.B.—We cannot publish Tenders unless authenticated by the name and address of the sender.]

ABERDEEN.—For additions, &c., to house and farm buildings, Red Craigs, Nigg. Mr. Wm. Ruxton, architect, Aberdeen:—

Masonry.

John Ross & Co.	£109 10	James Reid, Banchory Devenick *	£92 6
Alexr. Thomson	103 0		

Carpentry.

Alexander Murray	£256 0	Robert Thomson & Son	£129 5
George Lamb	147 10	Edward & Rae	120 0
William Gordon	139 0	James Henderson, Holburn-street, Aberdeen *	117 0
William P. Robertson	131 10		

Slating.

Jas. Wilson	£42 16	Alexr. Law, Little Chapel-street, Aberdeen *	£35 5
S. Christie, jun.	37 15		

Plastering.

Jas. Stewart, Rosemount-place, Aberdeen * £14 10
* Accepted.

BIRMINGHAM.—For the erection of a mortuary, &c., for the Yardley Burial Board. Mr. A. H. Hamblin, architect, 24, Temple-row, Birmingham:—
Price & Son, Broad-road, Acocks Green, Birmingham .. £234

BROMYARD (Worcester).—For the erection of buildings and structural alterations at the Workhouse, Linton, for the Union Guardians. Mr. A. Hill Parker, architect, 5, Foregate-street, Worcester. Quantities by architect:—

J. Kendrick	£3,548 0 0	Stokes	£2,625 0 0
Bowers	3,105 0 0	Newbold, Bromyard *	2,399 10 6
Bromage & Evans	2,923 15 8	James	2,358 9 10
Edwards	2,750 0 0	Welch	2,224 0 0
Hayes	2,748 0 0	* Accepted.	

BURNLEY.—Accepted for the execution of sewerage works (two contracts), for the Highways and Sewage Committee. Mr. G. H. Pickles, Borough Surveyor, Burnley. Quantities by Borough Surveyor:—

Briercliffe-road, &c., Sewerage Works.

John Miles, 5, Devonshire-road, Burnley £880 6 10

Coal Clough-lane, &c., Sewerage Works.

A. Braithwaite & Co., Horsforth, Leeds £3,094 18 10

BUXTON.—Accepted for the erection of a cottage and store, for Mr. J. Harrington. Messrs. Garlick & Flint, architects, Terrace-road, Buxton. Quantities not supplied:—
A. Wall, Buxton £350

DURHAM.—For the erection of boundary walls, gates, &c., West Cornforth, for the School Board. Mr. H. T. Gradon architect, 22, Market-place, Durham:—

Geo. T. Manners	£119 0 0
Thos. Bell, Coxhoe (accepted)	72 16 9

DUDLEY.—For the erection of a cottage, Himley-road, for Mr. M. J. Banks. Mr. A. Ramsell, architect, Dudley:—

Love & Flint	£395	Dudley & Co.	£305
H. Golding & Sons	325	Marsh Bros.	295
Whittaker & Co. *	310	* Accepted.	

DUDLEY.—For the erection of offices, warehouses, and belting factory, Trindle-road. Mr. A. Ramsell, architect, Wolverhampton-street, Dudley:—

Marsh Bros.	£1,634	Whittaker & Co.	£1,410
W. Ledbury & Co.	1,485	Webb & Round *	1,400
Love & Flint	1,450	* Accepted.	

EASTLEIGH (Hants.).—For laying stoneware storm-water drains, for the Urban District Council. Mr. H. J. Weston, C.E., 24, Portland-street, Southampton:—

D. H. Porter	£1,165 0	Saunders & Co.	£884 10
C. Hutchings	1,134 0	Crook & Bellew, Clausentum-road, Southampton (accepted)	829 0
F. Osman	957 0		
J. Boyes	947 0		

[Engineer's protecting estimate, £950.]

EDMONTON.—For alterations and additions to "Shrubbery House," Edmonton, for the Edmonton Co-operative Society. Mr. C. Bell, architect, 3, Salters' Hall-court, Cannon-street, E.C. Quantities by Messrs. Stanger & Son, 21, Finsbury-pavement:—

H. Knight & Son	£821	Jarvis & Son	£797
Monk	810		

ENFIELD LOCK.—For erecting a school building and appurtenances at Chesterfield-road, Enfield Lock, for the Enfield School Board. Mr. G. E. T. Lawrence, architect, 181, Queen Victoria-street, E.C. Quantities by Messrs. D. Campbell & Son, 69, Finsbury-pavement, E.C.:—

Kellett	£15,550 5	F. J. Coxhead	£14,092 0
Percival Hart	15,133 10	Knight & Son	13,822 0
Kingerlee	14,867 0	Gray Hill	13,557 0
Kirk & Randall	14,834 0	Faithead & Son	13,120 0
Godson & Sons	14,535 0	C. H. Hunt	13,091 0
Parnell & Sons	14,468 0		

FLEETWOOD (Lancs.).—For the erection of four houses, Cleveleys, for Mr. J. Wright. Messrs. Drummond & Sons, architects, Fleetwood. Quantities by architects:—
J. Chorley, Thornton, Poulton-le-Fylde £815 10

GRAVESEND.—For improvement works at the Town Hall and Municipal Buildings, for the Town Hall Markets Committee. Mr. A. C. Rayner, architect, 16, New-road, Gravesend:—

W. Tuffee	£298	W. H. Rayfield, London-road, Northfleet *	£248
Multon & Wallis	289		
H. Martin	259	* Accepted.	

GREAT MARTON (Lancs.).—Accepted for the erection of school buildings, for the Trustees of Baines' Endowed School. Mr. Wm. Cardwell, architect, 46, White Gate-lane, Blackpool:—
John Hill, Marton, Blackpool £1,230 15

GREAT YARMOUTH.—Accepted for additions, &c., to the hospital. Messrs. Bottle & Olley, architects, 5, Queen-street, Great Yarmouth. Quantities by architects:—

Bricklaying, Carpentry, &c.—G. Beckett, Great Yarmouth £1,275 0 0

Plumbing, Painting, &c.—G. Platt & Son, Great Yarmouth 203 11 9

[Architect's estimate, £1,500.]

LENNOXTOWN (N.B.).—For providing and laying c.-i. watermain, &c., for the Water Committee. Messrs. Niven & Haddin, C.E., 131, West Regent-street, Glasgow:—

D. Murray	£745 14 0	W. Simpson, junr.	£654 18 4
P. Bow	723 0 2	H. Hastie	650 17 4
J. Faton & Co.	687 11 0	J. Pollock	650 10 10
A. Stark & Sons	672 14 9	J. Miller	644 9 9
W. Donald	668 3 0	A. Gow	636 17 5
D. Shanks	665 3 11	D. Messer & Co., Glasgow (accepted)	610 11 0
R. C. Bubner	656 19 0		

LONDON.—For the construction of a boundary-wall, Wendel Park, for the Hammersmith Vestry. Mr. H. Mair, C.E., Vestry Hall, Broadway, Hammersmith, W.:—

Buckeridge Bros.	£959
R. M. Heywood, Hammersmith (accepted)	852

LONDON.—For heating with small-bore pipes the Congregational Church and Schools, Lewisham High-road, S.E. Mr. George Baines, architect, 4, Great Winchester-street, E.C. :—

	Church.	Schools.	
W. Stainton	£230 0	£93 15	£323 15
A. M. Perkins & Son	164 0	130 0	294 0
J. Wontner Smith, Gray, & Co.	191 0	94 15	285 15
Musgrave & Co., Ltd.	131 10	95 0	226 10
J. L. Bacon & Co., 34, Upper Gloucester-place, London, N. W.*	108 0	84 0	192 0

* Accepted for schools only at present.

LONDON.—For reinstatement of Messrs. Lloyd & Sons' premises, Mill-street, Dockhead, S.E., after fire. Messrs. Geo. Elkington & Son, architects :—

Holloway Bros.	£1,060	Balaam Bros.	£760
H. Wells	1,030	J. Greenwood	743
Howell J. Williams	875	Battley, Son, & Holness	725

LONDON.—For the erection of four one-story shops and new entrance to chapel in front of the Union Tabernacle, Wandsworth-road, S.W. Messrs. R. Price & Son, surveyors, Clapham :—

Thos. Ford	£722 0	C. Cumick & Son, St. John's Hill*	£409 0
Garrett & Son	653 10		
Bowering & Bilham	529 10		

* Accepted.

LONDON.—For alterations to lavatories and erection of engine-house at the workhouse, St. Leonard's-street, Bromley-by-Bow, E., for the Stepney Union Guardians. Mr. G. E. Holman, architect, 6, King's Bench-walk, E.C., and 109, Bow-road, E. Quantities by Mr. A. R. Ball, 118, High Holborn, W.C. :—

W. G. Holland	£2,473	G. Wales, Hackney*	£2,300
Atherton & Dolman	2,380	A. Symes	2,280
T. White & Son	2,313	A. Wallis	2,119
C. L. Cole	2,308		

* Accepted.

LONDON.—For exterior painting and pointing at Tottenham-road Board School, for the School Board for London. Mr. T. J. Bailey, Architect :—

D. Gibb & Co.	£328	C. Willmott	£205
H. Knight & Sons	234	Marchant & Hirst	199
G. Munday & Sons	233		

LONDON.—For making new saloon bar and sundry alterations at the "Adelaide Tavern," Chalk Farm, for Messrs. Wilson & Son. Mr. A. J. Perriam, architect, 52, St. John's Villas, N. :—

Evans	£547	Gould & Brand	£447
Marchant & Hirst	516		

[Architect's estimate, £557.]

LONDON.—For repairs, &c., to 76 houses and shops, in Pimlico Walk, Fanshaw-street and Aske-street, Hoxton, for Mr. T. Arno. Mr. A. J. Martin, architect and surveyor, 386, Old-street, E.C. :—

	No. 1	No. 2.	No. 3.	No. 4	No. 5.	No 6.	Total.
	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.	£ s.
Pringle	410	962 0	825 0	31 0	294 0	85 0	2607 0
Goodall	376	900 0	760 0	32 0	253 0	72 0	2391 0
Hood	418	716 0	585 0	25 0	172 0	42 0*	1996 0
Clark	214	775 0	575 0	11 15	113 10	38 0	1727 5
Weibking & Sons	203	746 10	546 10	10 0	109 10	33 15	1624 5
Speaight†	—	—	—	—	—	—	968 0

* Surveyor's fees. † This was an informal tender.

LONDON.—Accepted for sundry alterations, decorative and sanitary works, at 28, York-terrace, Regent's Park, N.W., under the superintendence of Mr. Frederick Colyer, 18, Great George-street, Westminster, S.W. :—

Alterations and Decorations.—Blythe & Co. £531
Sanitary Work.—Dent & Hellyer 295

LONDON.—Accepted, at per schedule of prices, for pulling down and part rebuilding at No. 51, Charlotte-street, Fitzroy-square, W., for Mrs. Gray. Mr. G. Gordon Stanham, architect, 10cB, Queen Victoria-street, E.C. :—
John Appleby, Cornwall-road, S.E., and Richmond.

LONDON.—For rebuilding the retaining wall on the east side of the approach to the mansion in Clissold Park, and of repairing and pointing the wall and painting the railing on the opposite side of the approach, for the London County Council :—

G. E. Jeffries	£217 14 6	Holland & Hooker	£178 10 0
W. Wells	181 0 0	Williamson & Son	143 0 0
A. Wallis	181 0 0	W. Shurmur*	129 0 0

* Accepted.

PORTSMOUTH.—For the erection of a block of buildings at the Royal Portsea, Portsmouth and Gosport Hospital. Mr. A. H. Bone, architect, Cambridge Junction, Portsmouth :—

E. & A. Sprigings	£1,757	Crockerell	£1,625
Perkins	1,679	Jones, Southsea*	1,592

* Accepted.

TENBY.—For additions to "Bellfield," Tenby. Mr. F. L. Fither, architect, London, W. Mr. Bernard Swinstead, surveyor, London, W.C. :—

Stephens, Bastow, & Co., Ltd.	£2,900 0	D. Jenkins	£2,600 0
Davies Morgan	2,788 0	Williams	2,493 0
		Phillips & Owens	2,250 10

TO CORRESPONDENTS.

A. H. (too late: next week).

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THE BATH STONE FIRMS, Ltd.
BATH,
FOR ALL THE PROVED KINDS OF
BATH STONE.
FLUATE, for Hardening, Waterproofing and Preserving Building Materials.

HAM HILL STONE.
The attention of Architects is specially invited to the durability and beautiful colour of this material. Quarries well opened. Quick despatch guaranteed. Stonework delivered and fixed complete. Samples and estimates free. Address, The Ham Hill Stone Co., Norton, Stoke-under-Ham, Somerset. London Agent: Mr. F. A. Williams, 16, Craven-st., Strand, W.C. [Advt.

Asphalte.—The Seyssel and Metallic Lake Asphalte Company (Mr. H. Glenn), Office, 45, Poultry, E.C.—The best and cheapest material for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co. [Advt.

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SLATER and TILER.
ESTIMATES GIVEN FOR
SLATING AND TILING,
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Penrhyn - Bangor,
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And other description of Slates ready for immediate delivery to any Railway Station.
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BETHNAL GREEN SLATE WORKS,
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COMPANY,
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SUPPLY THE BEST MATERIAL AND WORKMANSHIP FOR BUILDINGS, DAMP COURSES, AREAS, ROOFS, WASH-HOUSE AND DAIRY FLOORS, &c., &c.
This Asphalte was chosen to be laid at Sandringham, on the new General Post Office, and other important buildings.

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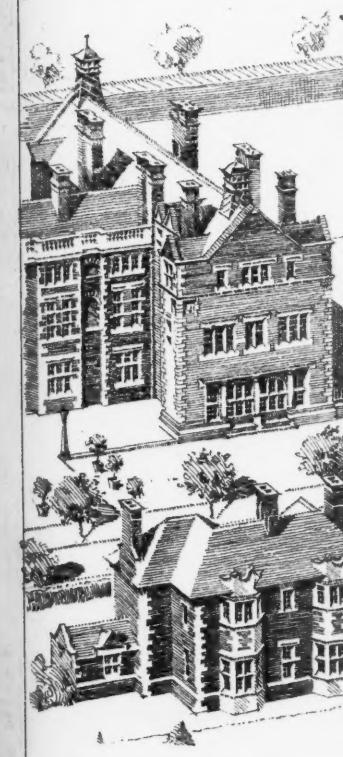
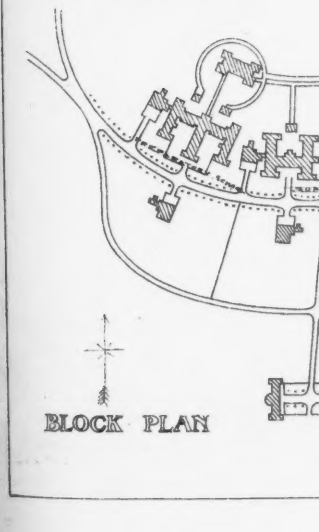
IRON CISTERNS.
F. BRABY & CO.
VERY PROMPT SUPPLY.
LARGE STOCK READY.
Particulars on application.
CYLINDERS FOR HOT-WATER CIRCULATION.
LONDON:
352 to 364, EUSTON-ROAD N.W., and
218 and 220, HIGH-STREET, BOROUGH, S.E.
LIVERPOOL:
6 and 8, HATTON GARDEN.
GLASGOW:
47 and 49, ST. ENOCH-SQUARE.

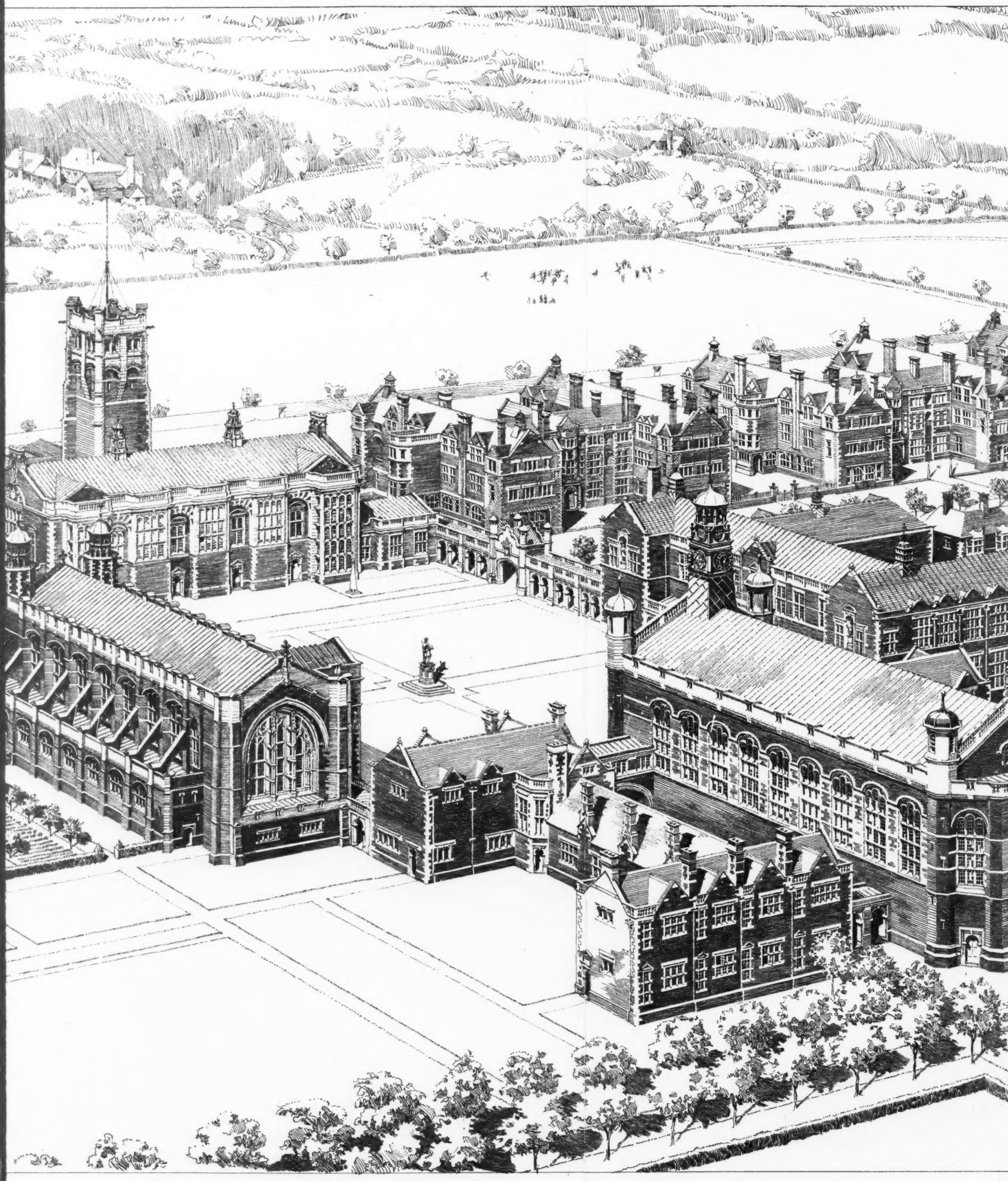




BLOCK PLAN

CHRIST'S·HOSPITAL
THE·NEW·BOARDING
SCHOOLS to be ERECTED
AT·HORSHAM

GENERAL VIEW OF THE DESIGN FOR

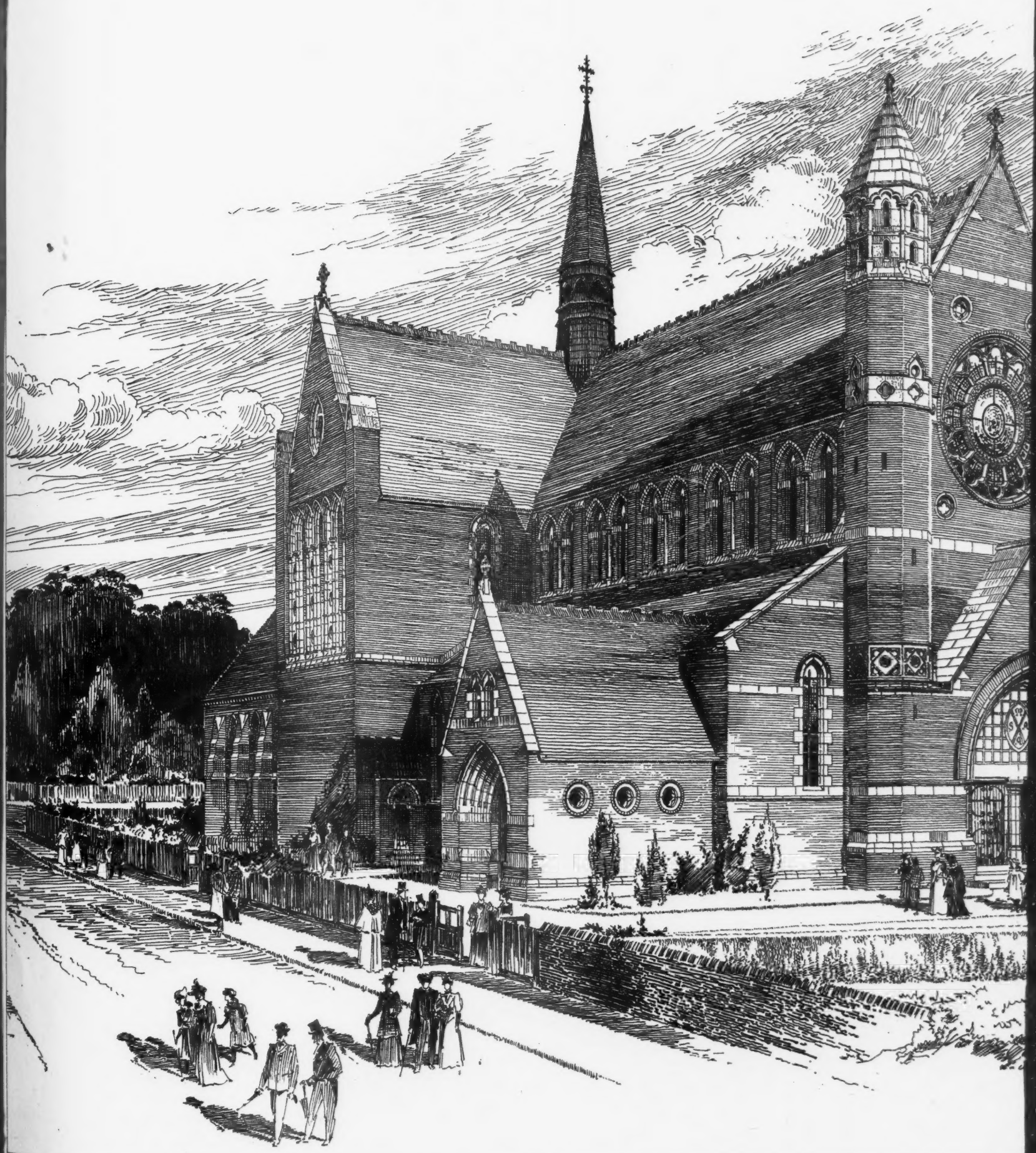


GENERAL VIEW OF THE DESIGN FOR THE NEW CHRIST'S HOSPITAL SCHOOLS.—Messrs. Aston Webb & Ingress Bell, Architects.

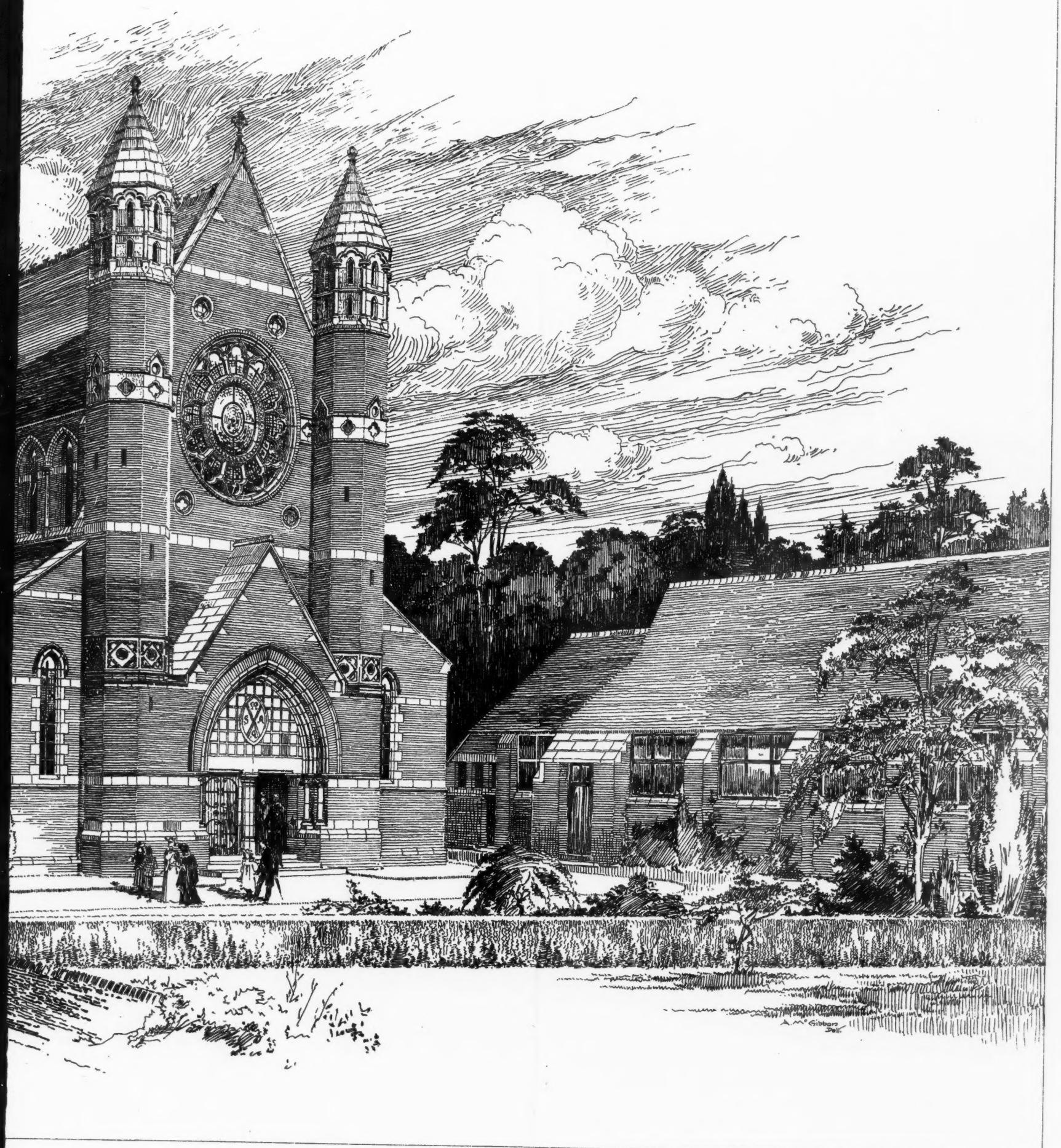
INA PHOTO SPRAGUE & Co 4 & 5 EAST HARDING STREET FETTER LANE E.C

s.

NORTH WEST VIEW S:ANDREW'S : WILLESDEN : JAMES BROOKS & SON ARCHITECTS



BROOKS & SON ARCHITECTS



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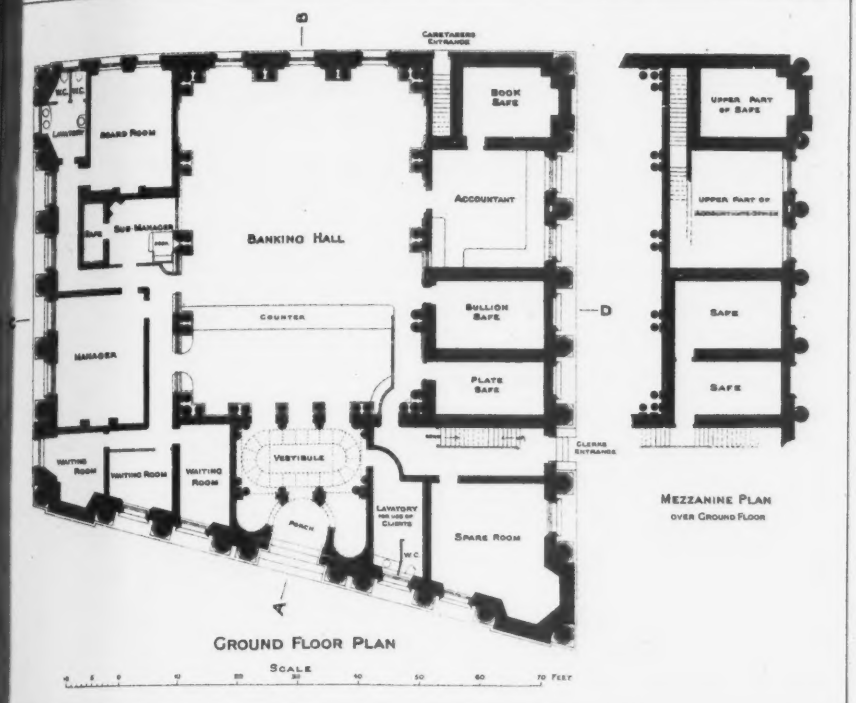

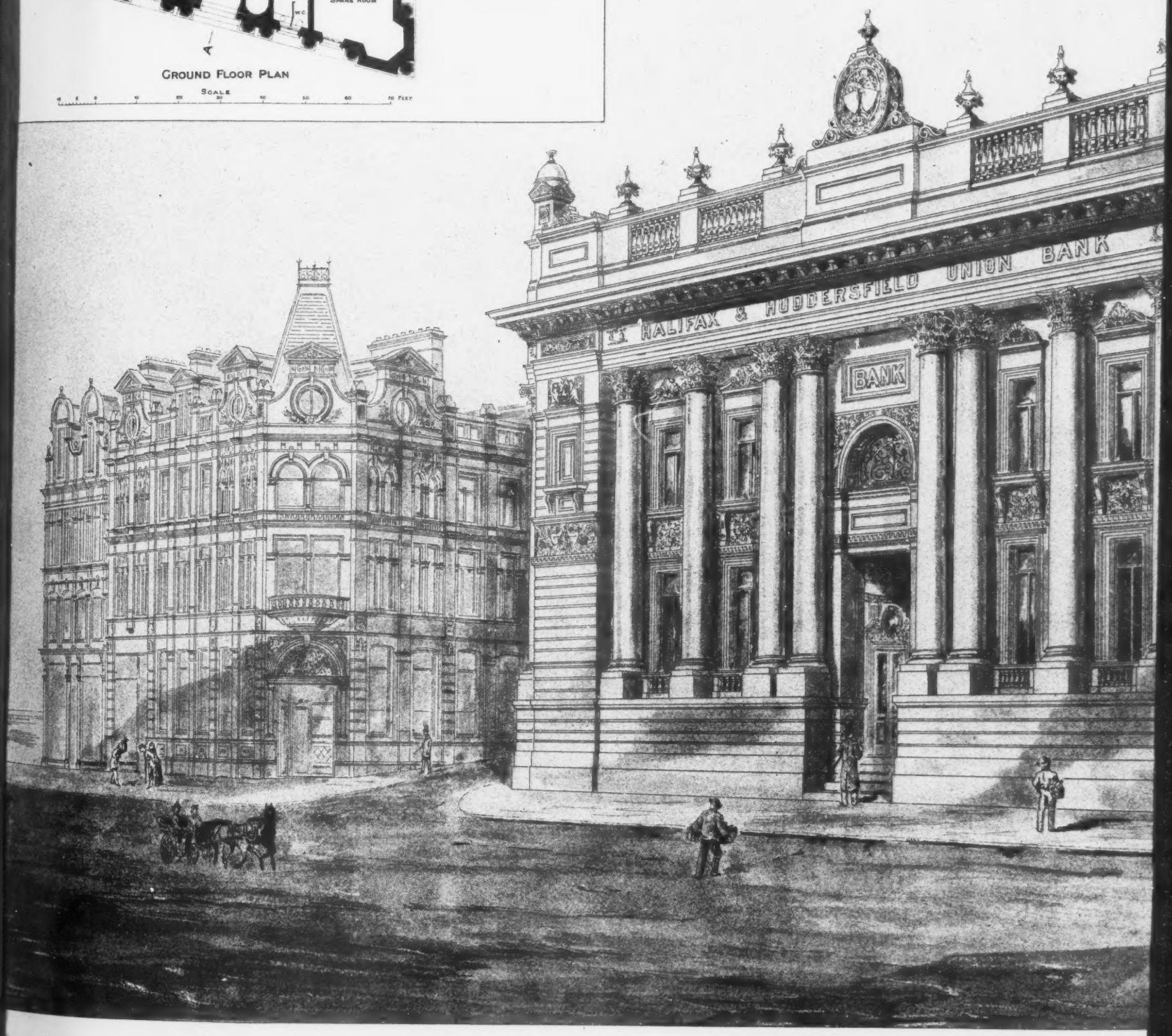

HALIFAX BANK COMPETITION: SECOND PREMIATED DESIGN.—By

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OND PREMIATED DESIGN.—By Mr. J. B. Mitchell-Withers, A.R.I.B.A.

"LEENSIDE"
NOTTINGHAM
Arthur W. Brewill
Basil E. Baily
Architects
NOTTINGHAM & NEWARK

HOUSE AT WOODSIDE PARK. N

Mr William J. Walker, Architect.

ENTRANCE FRONT

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